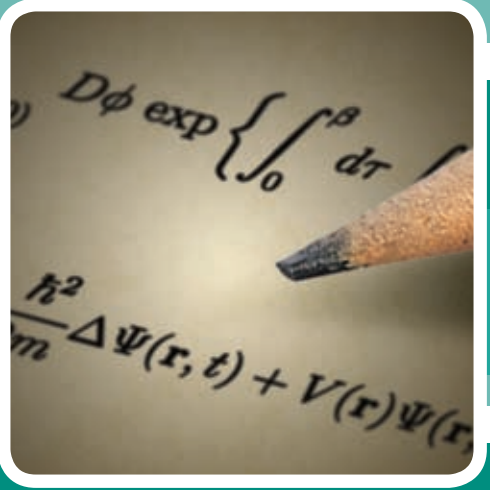
Dublin Institute for Advanced Studies

Institiúid Ard-Léinn Bhaile Átha Cliath



ANNUAL REPORT
TUAIRISC BHLIANTÚIL 2008

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Chairman's Introduction
Réamhrá an Chathaoirligh

2008 was a year of significance in a number of respects for the Dublin Institute for Advanced Studies (DIAS), an organisation unique within the Irish research system. This community of scholars organised in three autonomous Schools is devoted to pushing out the boundaries of knowledge and fully aware of the current drive towards a smart knowledge-based economy.

A Summer School in Medieval and Modern Irish language and literature was reintroduced by the Institute's School of Celtic Studies in July 2008 and proved a great success. Its popularity was evident from the number of applicants but unfortunately pressure of space necessitated limiting the number of participants to eighty. Students from eleven countries took part and the courses were entirely conducted by the staff and Fellows of the school. The school is indebted to an anonymous donor for the extremely generous support.

A major achievement of the School's ISOS programme was the digitisation of the Book of the O'Connor Don kindly made available to the School by its owner Conor Piers Nash. This manuscript written in Ostend in 1613 contains an important collection of bardic verse now made available on the web to many scholars.

During the year 2008 two collections of books were bequeathed to the School that of Fr Patrick Ignatius McLoughlin and that of the late Proinsias Mac Cana a former Senior Professor. The Institute is indebted to the Mac Cana family for this very generous gift.

A significant development of our ongoing drive to promote a strengthening of the relationship between scholarship in the Humanities and Sciences was the commencement of a programme with the School of Theoretical Physics and Celtic Studies of a project to carry out laser scanning of the Ogham inscriptions and to make them available with transliteration and commentary on the Institute's website. Some forty scholars attended the initial conference and partook of a valuable and positive debate.

The School of Theoretical Physics and physicists from NUI Maynooth have established a network of European researchers who are working on topological quantum computation. A successful symposium on this topic took place in the DIAS in September 2008. To progress this research area the School welcomed two Schrödinger Fellows Joost Slingerland and Volker Braun.

The ever increasing importance of data transmission and data handling has been of central importance to the School for many years and Corvil Networks once again supported the very popular John Lewis Lecture series which are held jointly with the Hamilton

Bliain shuntasach ar dhóigheanna áirithe ba ea 2008 d'Institiúid Ard-Léinn Bhaile Átha Cliath (DIAS), eagraíocht uathúil i gcóras taighde na hÉireann. Tá an pobal scoláirí seo eagraithe i dtrí Scoil uathrialacha, agus tá siad tugtha do leathnú amach teorainneacha an eolais agus is maith is eol dóibh faoin mbrú reatha i dtreo geilleagair eolasbhunaithe cliste.

Chuir Scoil an Léinn Cheiltigh san Institiúid tús arís lena Scoil Samhraidh i mbliana agus ritheadh í go rathúil i mí Iúil 2008. Ba léir ó líon na n-iarratas go raibh móréileamh uirthi ach ar an drochuair ní raibh dóthain spáis ann ach d'ochtó rannpháirtí. Bhí mic léinn páirteach óna haon tír déag agus stiúir foireann agus Ánraí na scoile na cúrsaí uile. Tá an Scoil buíoch do dheontóir anaithnid faoi leith a thug tacaíocht fíorfhlaithiúil.

Mórghníomh faoi chlár ISOS na Scoile ba ea digitiú Leabhar O'Connor Don, curtha ar fáil go lách don Scoil ag a úinéir Conor Piers Nash. Sa lámhscríbhinn seo, a scríobhadh in Ostend i 1613, tá cnuasach tábhachtach d'fhilíocht na mbard curtha ar fáil anois ar an Idirlín dá lán scoláirí.

Bronnadh dhá chnuasach leabhar ar an Scoil i rith na bliana 2008, cnuasach an Ath. Patrick Ignatius McLoughlin agus cnuasach an iarOllaimh Shinsearaigh Proinsias Mac Cana. Tá an Institiúid faoi chomaoin ag Clann Mhic Chana as an mbronnadh fíorfhlaithiúil seo.

Forbairt shuntasach inár mbrú leanúnach chun láidriú an ghaoil idir na Daonnachtaí agus na hEolaíochtaí a chur chun cinn ba ea tús tionscadail le Scoil na Fisice Teoiriciúla agus Scoil an Léinn Cheiltigh chun scanadh léasair a dhéanamh ar inscríbhinní Oghaim agus iad a chur ar fáil le traslitriú agus tráchtaireacht ar shuíomh Idirlín na hInstitiúide. D'fhreastail thart ar dhaichead scoláire ar an gcéad chomhdháil agus ghlac siad páirt i ndíospóireacht a bhí luachmhar agus dearfach.

Tá líonra taighdeoirí Eorpacha bunaithe ag Scoil na Fisice Teoiriciúla agus ag fisicithe ó Ollscoil na hÉireann, Má Nuad. Tá na taighdeoirí ag obair ar an ríomhaireacht chandamach thoipeolaíoch. Bhí siompóisiam rathúil ar an ábhar seo in DIAS i mí Mheán Fómhair 2008. Chun an réimse taighde seo a chur ar aghaidh, d'fháiltigh an Scoil roimh bheirt Ánra Schrödinger, Joost Slingerland agus Volker Braun.

Mathematics Institute (TCD). The Head of the Theory Group at Microsoft Research, Jennifer Tour Chase gave her exciting and very well attended lecture on 'The mathematics of Dynamic Random Networks' and later in the year Dr Sreenivasan, Director of the International Centre of Theoretical Physics in Trieste gave a lecture on cryogenic turbulence.

The highlight event in the school was the 2008 Public lecture which was given by Rolf Dieter Heuer the Director General of CERN and it was attended by an audience of over one thousand persons

The year was very productive for Astronomy and Astrophysics the recently linked sections in the School of Cosmic Physics. Of the some fifty publications from the section two of the papers appeared on the front cover of the prestigious journal Astronomy and Astrophysics.

In national e-structure provision the DIAS continued to play a leadership role. The national capability computing service (IBM Bluegene system) purchased by the DIAS with HEA support on behalf of a consortium of major Irish research institutions and hosted by HEAnet was officially launched by the Tánaiste Mary Coughlan TD in October 2008.

The Council continues to work closely with the respective Chairmen and Directors of the Schools and wishes to express its thanks for their unstinting work throughout the year. Likewise the DIAS continues to work closely in particular, with the Department of Education and Science and the Higher Education Authority and Council acknowledges the support and cooperation received from them throughout 2008.

I take this opportunity to thank the Council and to pay tribute to the staff for their hard work and their loyalty to the DIAS.

Dervilla Donnelly
Chairman of
the Institute.

Dervilla Donnelly
Cathaoirleach
Comhairle na
hInstitiúide.

Tá tábhacht le tarchur sonraí agus le láimhseáil sonraí agus tá an tábhacht sin ag dul i méid i gcónaí agus is rud lárnach tábhachtach iad sa Scoil le blianta fada; arís eile, thacaigh Corvil Networks le Léachtaí John Lewis, an tsraith móréilimh a rithimid i gcomhpháirt le hInstitiúid Matamaitice Hamilton (TCD). Thug Ceannaire an Ghrúpa Teoirice ag Microsoft Research, Jennifer Tour Chase, a léacht ar 'The mathematics of Dynamic Random Networks', a mheall a lán éisteoirí, agus níos déanaí sa bhliain thug an Dr Sreenivasan, Stiúrthóir Lárionaid Idirnáisiúnta na Fisice Teoiriciúla, Trieste, léacht ar shuaiteacht chrióigineach.

Ó thaobh imeachtaí de, ba é buaicphointe na scoile an Léacht Phoiblí 2008 a thug Rolf Dieter Heuer, ard-stiúrthóir CERN, a mheall lucht éisteachta i bhfad os cionn míle duine.

Bhí bliain an-táirgiúil ag an Réalteolaíocht agus an Réaltfhisic, an dá rannóg a comhnascadh le déanaí i Scoil na Fisice Cosmaí. Den leathchéad nó mar sin d'fhoilseachán na rannóige, cuireadh dhá pháipéar ar chlúdach tosaigh na hirise ardghradaim Astronomy and Astrophysics.

Lean ról ceannaireachta DIAS maidir le soláthar e-infreastruchtúir náisiúnta. I mí Dheireadh Fómhair 2008, bhí seoladh oifigiúil na seirbhíse náisiúnta ríomhaireachta fíoréifeachtaí (córas BlueGene IBM) a cheannaigh DIAS le tacaíocht an HEA thar ceann cuibhreannas de na príomh-insititiúidí taighde Éireannacha agus atá óstáilte ag HEAnet. An Tánaiste, Mary Coughlan TD, a sheol é.

Leanann an Chomhairle ag obair i ndlúthchomhar le Cathaoirligh agus le Stiúrthóirí na Scoileanna faoi seach agus is mian léi a buíochas a ghabháil a gcuid oibre a dhéanann siad gan stad gan staonadh i rith na bliana. Chomh maith leis sin, leanann DIAS ag obair i ndlúthchomhar leis an Roinn Oideachais agus Eolaíochta agus leis an Údarás um Ard-Oideachas go háirithe agus admhaíonn an Chomhairle an tacaíocht agus an chomhoibriú a fuair sí uathu i gcaitheamh na bliana 2008 ar fad.

Glacaim leis an deis seo chun buíochas a ghabháil leis an gComhairle agus chun ómós a thabhairt don fhoireann as a gcuid oibre crua agus as a ndílseachta do DIAS.

School of Celtic Studies
Scoil an Léinn Cheiltigh: Achoimre

The Summer School in Medieval and Modern Irish language and literature held at the Institute from 14 to 26 July was a great success. Because of pressure of space it was necessary to limit student numbers to eighty, and many well qualified applicants had to be turned down. The students came from Ireland, Scotland, Wales, England, Germany, the Netherlands, Spain, Italy, Sweden, Norway, Finland, Japan, USA and Australia. The courses were entirely conducted by staff and fellows of the School. An outing to view the monastery at Glendalough was organised for the students on Sunday 20 July.

Early Irish Satire by Dr Roisin McLaughlin was launched on 2 October. This is a very important study on satire in Early Irish literature, and the author also edits satirical texts from the Old and Middle Irish periods. *The Celtic Question: Modern Constructs and Ancient Realities*, an expanded version of Professor Kim McCone's Myles Dillon Memorial Lecture, was launched during the Annual Tionól on 28 November.

The ongoing demand for our publications made it necessary to reprint the following: *Celtica* 1 part 1 (ed. T. F. O'Rahilly, 1946), *Celtica* 3 (ed. Myles Dillon, 1956), *The Irish of Tourmakeady, Co. Mayo: a phonemic study* (Seán de Búrca, 1958; repr. 1970), *The Book of Leinster* vol. 1 (ed. R. I. Best, Osborn Bergin and M. A. O'Brien, 1954), and *Lexique étymologique de l'irlandais ancien de J. Vendryes: lettre D* (ed. P.-Y. Lambert, 1996). The first volume in the Early Irish Law Series, *Bechbretha: an Old Irish law tract on bee-keeping* (ed. T. M. Charles-Edwards and F. Kelly, 1983) was reprinted with the addition of a new Appendix containing an edition and translation of a short legal passage on bee-keeping recently discovered by Liam Breatnach. Volumes 2, 3, 6 and 8 of the *Catalogue of the Irish manuscripts in the Royal Irish Academy* (T. F. O'Rahilly, Kathleen Mulchrone et al., 1926-1970) were reprinted. All eight volumes of this catalogue of the world's largest collection of Irish manuscripts can now be purchased from the Institute. Summer student Stephanie Rousseau worked on the preparation for online publication of back-numbers of *Celtica*.

ISOS (Irish Script on Screen) continued to thrive under the direction of Pádraig Ó Macháin, and over 2,200,000 visits to the website were recorded during the year. A major achievement was the digitisation of the Book of the O'Conor Don, kindly made available to the School by its owner Conor Piers Nash. This manuscript, written in Ostende in 1613, contains an important collection of

D'éirigh go maith leis an Scoil Shamhraidh i dteanga agus litríocht na Luath- agus Nua-Ghaeilge a reachtáladh san Institiúid ón 14 go dtí an 26 Iúil. Mar gheall ar easpa spáis bhí sé riachtanach na huimhreacha a choinneáil síos go dtí ceithre fichid duine, agus b'éigean dúinn a lán iarrthóirí deacháilithe a dhiúltú. Tháinig na mic léinn ó Éirinn, ó Albain, ón Bhreatain Bhig, ó Shasana, ón Ghearmáin, ón Ollainn, ón Spáinn, ón Iodáil, ón tSualainn, ón Ioruaidh, ón Fhionlainn, ón tSeapáin, óna Stáit Aontaithe, agus ón Astráil. Reachtáladh na cúrsaí go hiomlán ag foireann agus comhaltaí na Scoile. Eagraíodh turas dona mic léinn chun mainistir Gleann Dá Locha a fheiscint ar an Domhnach 20 Iúil.

Seoladh *Early Irish Satire* leis an Dr Roisin McLaughlin ar an 2 Deireadh Fómhair. Is staidéar an-tábhachtach é seo ar an aoir i litríocht na Luath-Ghaeilge, agus cuireann an t-údar téacsanna aoire in eagar ó ré na Sean-Ghaeilge agus ó ré na Meán-Ghaeilge. I rith an Tionóil, seoladh ar an 28 Samhain *The Celtic Question: Modern Constructs and Ancient Realities*, leagan forbartha den Léacht Chuimhneacháin Mhaolmhuire Díolúin a thug an tOllamh Kim McCone ar an 24 Aibreán.

Mar gheall ar an éileamh leanúnach a bhíonn ar ár gcuid foilseachán caitheadh na leabhair seo leanas a chur i gcló arís: *Celtica* 1 cuid 1 (eag. T. F. Ó Rathile, 1946), *Celtica* 3 (eag. Myles Dillon, 1956), *The Irish of Tourmakeady, Co. Mayo: a phonemic study* (Seán de Búrca, 1958; athchló 1970), *The Book of Leinster* iml. 1 (eag. R. I. Best, Osborn Bergin agus M. A. O'Brien, 1954), agus *Lexique étymologique de l'irlandais ancien de J. Vendryes: lettre D* (eag. P.-Y. Lambert, 1996). Deineadh athchló ar an gcéad imleabhar de Shraith Luathdhlí na hÉireann, *Bechbretha: an Old Irish law tract on bee-keeping* (eag. T. M. Charles-Edwards agus F. Kelly, 1983) le haguisín nua ina ndeintear eagrán agus aistriúchán ar mhír de théacs dlí a bhaineann le beachadóireacht a d'aimsigh Liam Breatnach le gairid. Deineadh athchló ar imleabhair 2, 3, 6 and 8 de *Chlár na Lámhscribhinní Ghaeilge in Acadamh Ríoga na hÉireann* (T. F. Ó Rathile, Caitilín Ní Maol-Chróin et al., 1926-1970). Anois, is féidir na hocht imleabhair den gclár seo don gcnuasach lámhscríbhinní Gaeilge is mó sa domhan a cheannach ón Institiúid. D'ullmhaigh mac léinn shamhraidh Stephanie Rousseau sean-uimhreacha de *Cheltica* le haghaidh a bhfoilsithe ar an idirlín.

Lean MPR (Meamram Páipéar Ríomhaire) ag forbairt faoi stiúradh an Ollaimh Pádraig Ó Macháin, agus bhí níos mó ná 2,200,000 cuairt don suíomh idirlín i rith na bliana. Ba mhór an t-éacht digitiú Leabhair Uí Chonchobhair Dhuinn, a chuir a úinéir Conor Piers Nash ar fáil co cineálta don

bardic verse, and its availability in digital form is a major asset for scholars. As a result of contacts between ISOS and the National Library of Ireland, Pádraig Ó Macháin travelled to Quebec City in April to acquire for the State a nineteenth-century Irish manuscript which had come to light in private ownership. Also digitised on ISOS was a manuscript bequeathed to the School by the late Fr Patrick Ignatius McLoughlin. This manuscript was written in Ballymahon, Co. Longford, by a scribe who gives his name as 'Séamus Ó Fearáoill' or 'James O'Farel'. A summary of its contents may be found at www.isos.dias.ie. On 2 February, ISOS organised another in its seminar series. This seminar, entitled 'The Virtual library of Switzerland', was conducted by Dr Christoph Flüeler, Professor of Manuscripts and Medieval Latin at the University of Fribourg, and attracted approximately fifty participants. The School registers its appreciation of the work of John O'Brien, who took over from Anne Marie O'Brien as ISOS photographer during her maternity leave.

Chairman of the Board Professor Anders Ahlqvist, Dr Roisin McLaughlin and the Director of the School Professor Fergus Kelly at the launch of Early Irish Satire.
Cathaoirleach an Bhoird An tOllamh Anders Ahlqvist, An Dr Roisin McLaughlin agus Stiúrthóir na Scoile An tOllamh Fergus Kelly ar ócáid seolta Early Irish Satire.

Current and retrospective cataloguing continued under the direction of the Librarian Margaret Kelly, with the assistance of the Library Assistant Órla Ní Chanainn. Research and bibliographical queries from members of the staff and from visitors were dealt with. Assistance with retrospective cataloguing was provided during the summer by Gretchen de Búrca. Two collections of books were bequeathed to the School: that of Fr Patrick Ignatius McLoughlin, and that of Proinsias Mac Cana, a former Senior Professor and Director of the School from 1986

Scoil. Scríobhadh an lámhscríbhinn seo in Ostende sa bhliain 1613 agus tá bailiúchán tábhachtach d'fhilíocht na mbard inti. Is mór an cúnamh do scoláirí í a bheith ar fáil i bhfoirm dhigiteach. Mar gheall ar theagmháil idir MPR agus Leabharlann Náisiúnta na hÉireann, chuaigh Pádraig Ó Macháin go dtí Cathair Quebec in Aibreán chun lámhscríbhinn den naoú aois déag a tháinig chun solais i seilbh phríobháideach a cheannach don Stát. Rinneadh digitiú freisin ar lámhscríbhinn a thiomnaigh an tAthair Pádraig Iognáid Mac Lochlainn don Scoil. Scríobhadh an lámhscríbhinn seo i mBaile Uí Mhatháin, Co. Longphoirt, ag scríobhaí a thug a ainm sa bhfoirm 'Séamus Ó Fearáoill' nó 'James O'Farel'. Tá achoimre d'ábhar na lámhscríbhinne seo le fáil ar www.isos.dias.ie. Ar an 2 Feabhra, d'eagraigh MPR seimineár eile ina sraith seimineár. Stiúradh an seimineár seo leis an Dr Christoph Flüeler, Ollamh le Lámhscríbhinní agus le Laidin Meánaoiseach in Ollscoil Fribourg, agus bhí tuairim caoga duine i láthair. Tá an Scoil buíoch do John O'Brien as ucht na hoibre a rinne sé mar ghrianghrafadóir MPR nuair a bhí Anne Marie O'Brien ar scor mháithreachais.

Leanadh le catalógú reatha agus aisbhreathnaithneach na Leabharlainne faoi stiúradh an Leabharlannaí Margaret Kelly le cabhair ón gCúntóir Leabharlainne Órla Ní Chanainn. Déileáladh le ceisteanna taighde agus bibleagrafaíochta ó bhaill na Scoile agus ó chuairteóirí. Chabhraigh Gretchen de Búrca le catalógú aisbhreathnaithneach i rith an tsamhraidh. Tiomnáiodh dhá bhailiúchán leabhar don Scoil: bailiúchán an Athar Phádraig Iognáid Mhic Lochlainn agus bailiúcháin Phroinsiais Mhic Cana, iar-Ollamh Sinsearach sa Scoil, agus Stiúrthóir ó 1986 go dtí 1987. Faoi láthair tá bailiúchán Mhic Lochlainn i Seomra 20, agus aistreófar bailiúchán Mhic Cana go dtí Seomra 21 i rith 2009. Beidh an dá bhailiúcháin ar fáil don fhoireann, do chomhaltaí agus do scoláirí.

Chríochnaigh an tOllamh Pádraig Breatnach a sheimineár ar dhánta ar Chlann Dálaigh (Eanáir-Feabhra), agus chríochnaigh an Dr Roisin McLaughlin a seimineár ar an dTráchtas Meadarachta Meán-Ghaeilge (Eanáir-Feabhra). I mí Márta thug an Dr Roy Flechner – agus é ar cuairt ó Choláiste na Tríonóide, Cambridge – seimineár ar an g*Collectio Canonum Hibernensis* atá ar intinn aige a thairiscint don sraith Scriptores Latini Hiberniae. Chríochnaigh an tOllamh Liam Breatnach a sheimineár ar théacs dlí Mean-Ghaeilge a bhaineann le gadaíocht capall agus le haoir (Aibreán-Bealtaine). Thug an tOllamh Fergus Kelly seimineár ar théacs neamhiomlán Sean-Ghaeilge ar chionta agus fadhbanna dlí idir lánúineacha pósta (Deireadh Fómhair-Mí na Nollag).

to 1987. The McLoughlin collection is currently kept in Room 20, and the Mac Cana collection is to be installed in Room 21 in 2009. Both collections will be available for the use of staff, fellows and scholars.

Professor Pádraig Breatnach completed his seminar on the O'Donnell poems (January-February), and Dr Roisin McLaughlin completed her seminar on the Middle Irish Metrical Treatise (January-February). In March, Dr Roy Flechner – while on a visit from Trinity College Cambridge – conducted a seminar on the *Collectio Canonum Hibernensis*, which he intends to submit to the Scriptores Latini Hiberniae series. Professor Liam Breatnach completed a seminar on a Middle Irish law-text dealing with horse-theft and satire (April-May). Professor Fergus Kelly gave a seminar (October-December) on a fragmentary Old Irish text dealing with offences and legal problems between married couples.

The editors of *Celtica*, Professors Malachy McKenna and Fergus Kelly, continued work on the preparation of Celtica 26. Professor Liam Breatnach completed his edition of 'Cinnus atá do thinnrem', a poem addressed to a pupil on his coming of age, and this was published in Ériu 58. He also continued to direct a project with the Bergin Fellows and O'Donovan Scholars preparing a diplomatic edition of the *Leabhar Breac* which will be made available free of charge on the School's website.

Professor Pádraig Breatnach edited vol. 36 of the journal Éigse, to which he contributed three articles. O'Donovan Scholar Nora White continued on an edition of the *Rule of Mo Chutu*, and finished work on the Monasticon Hibernicum database project, of which she has been Research Assistant since 2006. This database collects all available information regarding monastic sites pre-1200, and will be published next year on the School's website. The Bibliographer Alexandre Guilarte continued with the compilation of the fourth volume of the *Bibliography of Irish Linguistics and Literature*, focusing on the cataloguing and analysis of periodical publications in the field of Irish studies. Professor Aoibheann Nic Dhonnchadha worked on the preparation of fasciculus I (the medical manuscripts) of the new *Catalogue of Irish Manuscripts in the Library of Trinity College Dublin*. Bergin Fellow Dr Clodagh Downey worked on an edition of the poems of Cúán Ua Lothcháin († 1024).

O'Donovan Scholar Gordon Ó Riain completed his critical edition of poems by Maol Eachlainn 'na nUirsgéal' Lean eagarthóirí *Celtica*, na hOllúna Malachy McKenna and Fergus Kelly, ag obair ar ullmhú Celtica 26. Chríochnaigh an tOllamh Liam Breatnach a eagrán de 'Cinnus atá do thinnrem', dán in onóir do dhalta ag teacht in aois dó, agus foilsíodh in Ériu 58 é. Lean sé air ag stiúradh tionscnaimh leis na Comhaltaí Uí Aimhirgín agus leis na Scoláirí Uí Dhonnabháin ag ullmhú eagráin dhigitiúil den *Leabhar Breac* a bheidh ar fáil saor in aisce ar shuíomh idirlín na Scoile.

Professor Malachy McKenna in conversation with students at the Summer School.

An tOllamh Malachy McKenna i gcomhrá le mic leinn na Scoile Samhraidh.

Chuir an tOllamh Pádraig Breatnach imleabhar 36 den iris Éigse in eagar, agus d'fhoilsigh sé trí alt dá chuid féin ann. Lean an Dr Nora White, Scoláire Uí Dhonnabháin, ar eagrán de *Riagail Mo Chutu*, agus chríochnaigh sí a cuid oibre ar thionscnamh Monasticon Hibernicum, inar ghníomhaigh sí mar Chúntóir Taighde ó 2006 i leith. Bailíonn an bunachar seo gach eolas atá ar fáil faoi láithreacha mainistreach roimh 1200, agus foilseofar ar shuíomh idirlín na Scoile an bhliain seo chugainn. Lean an Bibleagrafóir Alexandre Guilarte le cnuasach an cheathrú imleabhair den *Bhibleagrafaíocht Teangeolaíochta agus Litríochta na Gaeilge*, ag díriú ar chatalogú agus anailís na bhfoilseachán tréimhsiúla i réimse léann na Gaeilge. D'oibrigh an tOllamh Aoibheann Nic Dhonnchadha ag ullmhú fascúil I (na lámhscríbhinní leighis) den *Chlár Nua desna Lámhscríbhinní Gaeilge i Leabharlann Choláiste na Tríonóide, Baile Átha Cliath*. D'oibrigh an Dr Clodagh Downey, Comhalta Uí Aimhirgín, ar eagrán de dhánta Chúáin Uí Lothcháin († 1024).

Chríochnaigh Gordon Ó Riain, Scoláire Uí Dhonnabháin, a eagrán criticiúil de dhánta Mhaol Eachlainn 'na nUirscéal' Uí Uiginn, agus bronnadh dochtúireacht air ó Ollscoil na

Ó hUiginn, for which he was awarded a doctorate by the National University of Ireland. A doctorate was conferred by the University of Dublin on O'Donovan Scholar Freya Verstraten for her thesis entitled 'The Anglicisation of the Gaelic nobility c. 1169-c.1366'. Dr Michelle O Riordan continued work on seventeenth-century political poetry. Dr Brian Ó Curnáin recorded speakers in various parts of Co. Galway, and continued work on a monograph on the Irish of East Galway. Professor Malachy McKenna carried out fieldwork in Rann na Feirste, Co. Donegal, and continued work on his linguistic study of the area. Eoin O'Flynn was appointed an O'Donovan Scholar from 1 October, and is working on a doctoral thesis on the Clann Cholmáin kings of Mide.

The Third Myles Dillon Memorial lecture was given on 24 April by Kim McCone, professor of Old and Middle Irish at the National University of Ireland Maynooth. He spoke on 'The Celtic Question: Modern Constructs and Ancient Realities'. A conference was held on Saturday 24 May in collaboration with the School of Theoretical Physics to set out a plan for the laser scanning of the Ogam inscriptions, and to make them available (with transliteration and commentary) free of charge on the website. The speakers at the Conference were: Professor Werner Nahm (School of Theoretical Physics), Dr Alexandre Tokovinine (Corpus of Maya Hieroglyphic Inscriptions, Harvard University), Colin Muir (Historic Scotland's Conservation Centre, Edinburgh), Annemarie La Penseé (National Museums, Liverpool), Professor Dáibhí Ó Cróinín and Dr Thierry Daubos (National University of Ireland Galway), Fionnbarr Moore (National Monuments Service) and Professor Fergus Kelly (School of Celtic Studies). Approximately forty people attended the conference, and there was valuable and positive debate about the feasibility of this project.

The annual Tionól of the School took place on Friday-Saturday 28-29 November, and was organised by Professor Pádraig Ó Macháin with assistance from the School Administrator, Eibhlín Nic Dhonncha. A total of twenty papers were delivered at the Tionól by speakers from Ireland, England, Wales, Germany, Holland, and Finland. There was an attendance in excess of one hundred at the Tionól. Professor Pádraig Breatnach gave the Statutory Public lecture at University College Dublin on the topic 'The Four Masters and their Works: a Team Enterprise'.

hÉireann. Bronnadh dochtúireacht ó Ollscoil Bhaile Átha Cliath ar Freya Verstraten, Scoláire Uí Dhonnabháin, dá tráchtas dar teideal 'The Anglicisation of the Gaelic nobility c. 1169-c.1366'. Lean an Dr Michelle O Riordan ag obair ar fhilíocht pholaitiúil ón seachtú céad déag. Rinne an Dr Brian Ó Curnáin taifeadeadh de chainteoirí in áiteanna éagsúla i gContae na Gaillimhe agus choinnigh sé air ag obair ar mhonagraf ar Ghaeilge Oirthear na Gaillimhe. Rinne an tOllamh Malachy McKenna obair pháirce i Rann na Feirste, Co. Dhún na nGall, agus lean air ag obair ar a staidéar teangeolaíoch den cheantar. Ceapadh Eoin O'Flynn ina Scoláire Uí Dhonnabháin ó 1 Deireadh Fómhair, agus tá sé ag obair ar thráchtas dochtúireachta ar ríthe Chlainn Cholmáin na Mí.

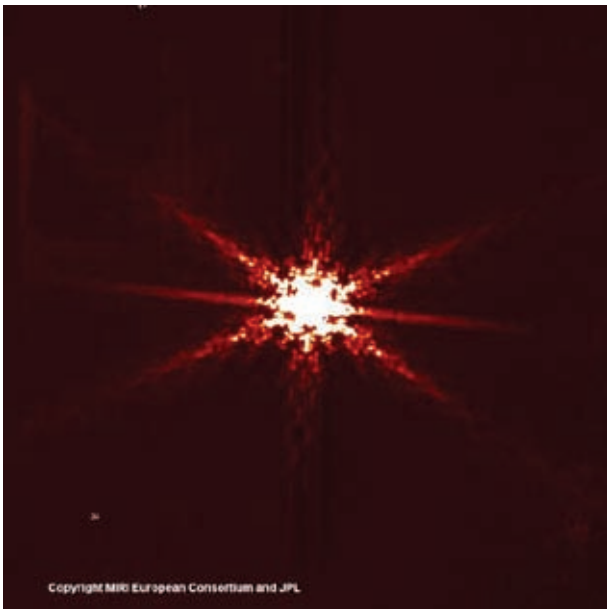
Thug Kim McCone, ollamh le Sean- agus le Meán-Ghaeilge in Ollscoil na hÉireann, Má Nuad, an tríú Léacht Chuimhneacháin Mhaolmhuire Díolúin ar an 24 Aibreán. Labhair sé ar an ábhar 'The Celtic Question: Modern Constructs and Ancient Realities'. Eagraíodh comhdháil ar an Satharn 24 Bealtaine i gcomhar le Scoil na Fisice Teoiriciúla chun plean a leagan amach chun scanadh léasair a dhéanamh ar na hinscríbhinní Oghaim agus iad a chur ar fáil (le trascríobh agus tráchtaireacht) saor in aisce ar an súiomh idirlín. Ba hiad cainteóirí ag an gComhdháil: an tOllamh Werner Nahm (Scoil na Fisice Teoiriciúla), an Dr Alexandre Tokovinine (Corp na nInscríbhinní Iaraiglifeacha Maya, Ollscoil Harvard), Colin Muir (Lár-ionad Caomhnaithe na hAlban, Dún Éideann), Annemarie La Penseé (Iarsmalanna Náisiúnta, Learpholl), an tOllamh Dáibhí Ó Cróinín agus an Dr Thierry Daubos (Ollscoil na hÉireann Gaillimh), Fionnbarr Moore (Seirbhís Séadchomharthaí Náisiúnta) agus an tOllamh Fergus Kelly (Scoil an Léinn Cheiltigh). Bhí tuairim daichead duine i láthair ag an gcomhdháil agus bhí díospóireacht luachmhar agus dearfach ann faoi indéantacht an tionscnaimh seo.

Reachtáladh Tionól bliantúil na Scoile Dé hAoine agus Dé Sathairn an 28 agus 29 Samhain; is é an tOllamh Pádraig Ó Macháin le cabhair ó Riarthóir na Scoile, Eibhlín Nic Dhonncha, a d'eagraigh é. Léadh fiche páipéar le scoláirí ó Éirinn, ó Shasana, ón Bhreatain Bhig, ón Ghearmáin, ón Ollainn agus ón Fhionlainn. Bhí níos mó ná céad duine i láthair ag an dTionól. Thug an tOllamh Pádraig Breatnach an Léacht Reachtúil sa Choláiste Ollscoile, Baile Átha Cliath, ar an ábhar 'The Four Masters and their Works: a Team Enterprise'.

School of Cosmic Physics
Scoil na Fisice Cosmaí

Astronomy and Astrophysics

The year was a productive one for the section with 47 refereed publications appearing and a further 22 preprints submitted. It was very gratifying that two papers from the section made the front cover of the journal Astronomy and Astrophysics and that the review article on High-energy Astrophysics with ground-based gamma ray detectors by Professor Aharonian, Assistant Professor J. H. Buckley and Gus Sinnis was listed as one of their ten highlights of 2008 by the editors of Reports on Progress in Physics. In addition staff of the section edited two volumes of conference proceedings and a further volume in the JETset lecture notes series was published. Two local workshops and one international conference were organised.



The first-light image from MIRI while it was under test at a temperature of 7 degrees above absolute zero (-266 degrees Celsius).

Íomhá an chéad solais ó MIRI agus í á tástáil ag teocht 7 gcéim os cionn dearbhnialais (-266 céim Celsius).

Among the research highlights of the year in the star formation group was the discovery of a further three brown dwarf stars with associated outflows bringing the total known to five (this was the subject of a press release at the Belfast meeting of the Royal Astronomical Society). Further observing time for this project was obtained on European Southern Observatory facilities and Dr Whelan was granted an individual Marie Curie fellowship to continue her work in this area. Much further work was carried out in the general area of star

Réalteolaíocht agus Réaltfhisic

Bliain tháirgiúil don rannóg ba ea é le 47 foilseachán measúnaithe i gcló agus 22 réamhphreasanna seolta isteach. Cúis sásaimh dúinn gur cuireadh dhá pháipéar ón rannóg ar chlúdach tosaigh na hirise Astronomy and Astrophysics agus gur chuir eagarthóirí Reports on Progress in Physics an léirmheas High-energy Astrophysics with ground-based gamma ray detectors leis an Ollamh Aharonian, leis an Ollamh Cúnta J. H. Buckley agus le Gus Sinnis ar a liosta de dheich mbuachphointe 2008. Anuas air sin, d'eagraigh foireann na rannóige dhá imleabhar d'imeachtaí comhdhála agus foilsíodh imleabhar eile sa tsraith nótaí de léachta JETset. Eagraíodh dhá cheardlann áitiúla agus aon chomhdháil idirnáisiúnta.

I measc bhuaiceanna thaighde na bliana sa ghrúpa réaltfhoirmíochta, aimsíodh trí réalt abhac donn le heis-sreabhaí gaolmhara, rud a chiallaíonn go bhfuil eolas againn ar cúig cinn acu anois. (Eisíodh preasráiteas faoi seo ag cruinniú an Chumainn Ríoga Réalteolaíochta i mBéal Feirste.) Fuair an tionscadal seo breis ama breathnaithe le saoráidí de chuid Réadlann Dheisceart na hEorpa agus bronnadh comhaltacht aonair Marie Curie ar an Dr Whelan chun leanúint ar aghaidh lena cuid oibre sa réimse seo. Rinneadh mórán oibre eile i réimse ginearálta na réaltfhoirmíochta agus ar fheiniméin ghaolmhara eis-sreabhaidh; ina measc seo braithníodh den chéad uair scaird adamhach ó phrótairéalta domhain-inleabaithe. Sholáthair dhá thionscadal seirbhís ghinearálta don phobal: forbraíodh píblíne ríomhaireachtúil uathoibríoch foinse oscailte a ghineann breathnúcháin sintéiseacha as insamhlaithe ríomhaireachtúla de scairdeanna; agus cuireadh bunachair sonraí ar líne de bhreathnúcháin ar scairdeanna phrótairéaltaí i ngníomh. Is féidir an dá thionscadal seo a chur i gcrích faoin ngréasán oiliúna taighde JETset atá maoinithe ag an AE agus comheagraithe ag an rannóg.

Sa réaltfhisic ardfhuinnimh, bhí an phríomhspéis dírithe ar an tsraith leanúnach de thorthaí nua ón gCóras Steiréascóipeach Ard-fhuinnimh de theileascóipeanna aitmeasféarach íomháite Cherenkov sa Namaib a bhfuil an DIAS páirteach ann. Forbairt spreagúil í gur braitheadh dhá réaltra ghníomhacha chlasaiceacha in aice láimhe mar fhoinsí TeV: Cen A agus M87. Go dtí seo, bhí gach foinse eachtar-réaltrach a raibh ar eolas i gcatagóir speisialta de bhlazar (réaltraí gníomhacha mar

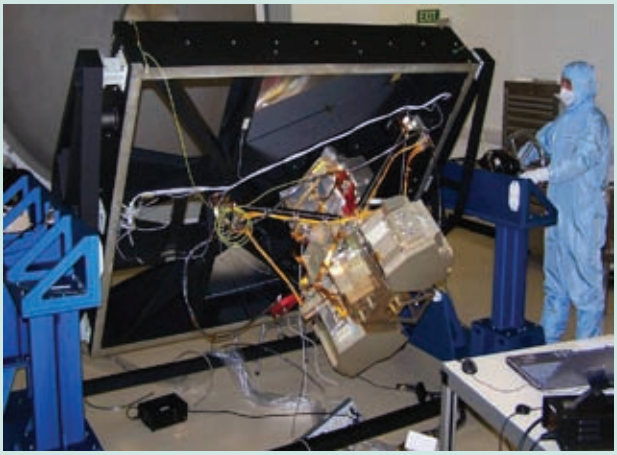
formation and associated outflow phenomena including the first detection of an atomic jet from a deeply embedded protostar. Two projects of general service to the community were the development of an open-source automatic computational pipeline generating synthetic observations from computational simulations of jets and the implementation of an online database of observations of protostellar jets. Both these projects are deliverables under the JETset EU-funded research training network which the section coordinates.

In high-energy astrophysics the major focus of interest was the continuing stream of new results from the High Energy Stereoscopic System of imaging atmospheric Cherenkov telescopes in Namibia in which the DIAS is a partner. An exciting development is the detection of two classical nearby active galaxies, Cen A and M87, as TeV sources. Until this all known extragalactic sources belonged to the rather special category of blazars (active galaxies where we happen to be looking almost straight down the jet). Detailed studies continued of many Galactic sources, including a number of resolved shell-type supernova remnants, a large number of pulsar wind nebulae and several peculiar binary sources. This work was complemented by a programme of theoretical and computational studies. Significant contributions were made to the physics case documents of two major ESFRI projects, the KM3NeT project for a neutrino telescope in the deep Mediterranean Sea and the CTA project for a next generation Cherenkov telescope array observatory.

Testing of the verification model of the MIRI instrument for the James Webb Space Telescope, to which DIAS is contributing some mid-infrared filters, was successfully completed during the year and the flight model is currently under construction. The DIAS participation in this project will now move from hardware to software in preparation for flight operations due to start in 2013. In a separate ground-based development Carlos del Burgo (one of our Schroedinger fellows) is one of the leaders of the proposal NAHUAL for a high resolution near-infrared spectrometer for the 10.4m GRANTECAN telescope located in the Observatorio Roque de Los Muchados in La Palma (one of the Canary islands). The section also participates in two robotic telescope projects mainly devoted to gamma-ray burst studies.

In national e-infrastructure provision the DIAS continued to play a leadership role. The national capability computing service (an IBM BlueGene system)

a bhfuilimid ag breathnú beagnach go díreach síos an scaird). Leanadh le mionscrúduithe ar a lán foinsí den Réaltra, ina measc roinnt iarsmaí taifithe den ollnóva le cruth blaoisc, líon ard de réaltnéalta gaoithe pulsáir, agus scata aisteach d'fhoinsí dhénártha. Comhlánaíodh an obair seo le clár staidéar teoiriciúil agus ríomhaireachtúil. Bhí ionchur suntasach i gcás-staidéir fisice de dhá thionscadal móra ESFRI: tionscadal KM3NeT le haghaidh teileascóp neoidríonó lonnaithe i ndomhain na Meánmhara; agus tionscadal CTA le haghaidh réadlann eagar teileascóipeach Cherenkov den chéad ghlúin eile.



The MIRI verification model (with DIAS supplied filters and beam-splitters installed) being tested at the Rutherford Appleton Laboratory in Oxford.

Samhail fhíorúcháin MIRI (le scagairí ó DIAS agus scoilteoirí léasacha suiteáilte) á tástáil ag Saotharlann Rutherford Appleton in Oxford.

Cuireadh críoch go rathúil i rith na bliana le tástáil na hionstraime MIRI do Spásteileascóp James Webb, atá ag fáil roinnt scagairí infridhearga ó DIAS, agus tá an tsamhail eitilte á tógáil faoi láthair. Bogfaidh páirtíocht DIAS sa tionscadal seo anois ó earraí crua go bogearraí mar ullmhú d'oibríochtaí eitilte atá sceidealaithe le tosú i 2013. I bhforbairt faoi leith ar thalamh, tá Carlos del Burgo (duine dár nÁnraí Schroedinger) ar cheann de cheannairí an togra NAHUAL le haghaidh speictriméadair ardtaifigh neas-infridheirg don teileascóp 10.4m GRANTECAN lonnaithe san Observatorio Roque de los Muchachos i La Palma (ceann de na hOileáin Chanáracha). Tá an rannóg páirteach chomh maith in dhá thionscadal a bhaineann le teileascóp róbatach atá dírithe go príomha ar roiseanna gháma-ghathacha.

Lean ról ceannaireachta DIAS maidir le soláthar e-infreastruchtúir náisiúnta. Tá an chéad bhliain iomlán curtha isteach ag an tseirbhís náisiúnta ríomhaireachta

purchased by the DIAS with HEA support on behalf of a consortium of all the major Irish research institutions completed its first full year of operation as part of the portfolio of services offered by the Irish Centre for High-End Computing (ICHEC). The system, which is hosted by HEAnet in their national hosting facility, was officially launched at a ceremony held in the Royal Irish Academy by the Tánaiste, Mary Coughlan TD, Minister for Enterprise Trade and Employment on 30th October 2008 in the presence of Larry Hirst, President of IBM EMEA. By the end of the year six research groups were using the system and two had progressed to the point of using larger scale facilities provided by IBM in the United States. Under the PRTLI-4 funded e-INIS project a major refresh of the national capacity service was carried out with the replacement of the Walton cluster by a new Silicon Graphics system named Stokes in December 2008. The Stokes system is hosted in the research IT building of UCD and both NUIM and UCD contributed additional resources to the project. Plans for a pilot national data service and an advanced optical network based on user controlled light path technology (lambda-switching), the other major components of e-INIS, were well advanced by the end of 2008.

Of necessity this short summary concentrates on only a few aspects of the work of the section which are of general interest. For a full account the detailed research report should be consulted.

fíoréifeachtach (córas BlueGene IBM) a cheannaigh DIAS le tacaíocht an HEA thar ceann cuibhreannas de na príomh-insititiúidí taighde Éireannacha mar chuid de phunann sheirbhísí atá curtha ar fáil ag Ionad na hÉireann don Ard-Ríomhaireacht (ICHEC). Tharla seoladh oifigiúil an chórais, atá óstáilte ag HEAnet, ag searmanas in Acadamh Ríoga na hÉireann ar an 30 Deireadh Fómhair 2008. An Tánaiste, Mary Coughlan TD, Aire Fiontar, Trádála agus Fostaíochta, a sheol é, i láthair Larry Hirst, Uachtarán IBM EMEA. Faoi dheireadh na bliana, bhí sé ghrúpa taighde ag úsáid an chórais agus lean dhá cheann acu ar aghaidh chun úsáid a bhaint as saoráidí ar scála níos mó a chuireann IBM ar fáil sna Stáit Aontaithe. Faoin tionscadal e-INIS a mhaoiníonn PRTLI-4, rinneadh athnuachan mhór ar an seirbhís toillte náisiúnta trí chóras grafaice sileacain ar a ngairtear Stokes a chur in áit an bhraisle Walton i Nollaig 2008. Tá córas Stokes óstáilte i bhfoirgneamh IT UCD agus thug UCD agus NUIM araon saoráidí breise don tionscadal. Faoi dheireadh 2008, bhí dul chun cinn maith déanta le pleananna don dá phríomhghné eile de e-INIS, seirbhís phíolótach sonraí náisiúnta agus ardlíonra optúil bunaithe ar theicneolaíocht riain solais faoi rialúcháin úsáideoirí (lascadh lambda).

Toisc gur achoimre ghairid é seo ní dhíríonn sí ach ar roinnt gnéithe d'obair na rannóige atá ina n-ábhar spéise ginearálta. Ba chóir breathnú ar an miontuairisc thaighde chun forbhreathnú ceart a fháil.

Geophysics

1. People

Two thousand and eight began on a high note with the arrival of Dr. Sergei Lebedev in February as an Assistant Professor within the Geophysics Section and holding the title of the Mallet Professor of Seismology. Professor Lebedev is solidly establishing himself as one of the world's leading experts in full waveform modelling of seismic waves travelling through a highly complex inhomogeneous Earth. Many around the world are already using his approaches and codes, and his move to DIAS enhances DIAS's international reputation considerably. Professor Lebedev immediately started to make an impact by having one of his Science Foundation Ireland (SFI) Research Frontier Programme (RFP) proposals funded, involving studying active tectonics using analysis of existing seismic data and geodynamic modelling, and by the end of the year already had built a research team of two PhD students, Joanne Buckenmeyer and Matthew Agius, with a Post-Doctoral Fellow (to be decided by competition) joining in early 2009.

Senior Professor Jones was also successful in funding competitions in 2008 having his INDEPTH-4 SFI RFP2008 funded, and having an Individual Project in the TOPO-MED Coordinated Research Programme within the TOPO-EUROPE EUROCORES funded by the Irish Research Council for Science, Engineering and Technology (IRCSET). These two projects brought in funding for two PDFs and two PhDs. Dr. Jan Vozer and Mr. Florian Le Pape (both commencing in 2009) will work with Professor Jones on the INDEPTH (InterNational DEep Profiling of Tibet and the Himalaya) Phase 4, which will study the complex geometries and dynamics of the northern rim of the Tibetan Plateau. Dr. Javier Fullea and Ms. Duygu Kiyan (both commencing in 2009) will work with Professor Jones on studying the tectonics of Morocco in TOPO-MED, particularly the suggestion that the Atlas Mountains do not have a lithospheric root. Additionally, with DIAS internal funding Professor Jones recruited Mr. Said Gaci to join the PICASSO project. Mr. Gaci is expected to be key to the project's success given his maturity and experience in western Sahara and his ability to speak Berber, Arabic, French and English.

Geoifisic

1. Daoine

Thosaigh 2008 ar nóta ard nuair a tháinig an Dr Sergei Lebedev i mí Feabhra mar Ollamh Cúnta i Rannóg na Geoifisice agus Ollamh Mallet le Seismeolaíocht mar theideal air. Tá an tOllamh Lebedev á chruthú féin mar dhuine de phríomhshaineolaithe an domhain i samhaltú lántonnchruthach de thonnta seismeacha ag taisteal trí Dhomhan sárchoimpléacs neamhaonchineálach. Cheana féin, tá a mhodhanna agus a chóid in úsáid go forleathan timpeall an domhain agus cuireann a theacht go DIAS go mór le clú idirnáisiúnta DIAS. Bhí tionchar láithreach ag an Ollamh Lebedev nuair a fuair sé cistiú do cheann dá thograí faoin gClár Teorainneacht Taighde de chuid Fondúireacht Eolaíochta Éireann; togra a bhaineann le scrúdú ar theicteoinic ghníomhach a dhéanann anailís ar shonraí seismeacha agus ar shamhaltú geoidinimice; agus faoi dheireadh na bliana bhí beirt mhac léinn PhD aige dá fhoireann taighde, Joanne Buckenmeyer agus Matthew Agius, móide Ánra Iardhochtúireachta (le ceapadh trí chomórtas) go luath in 2009.

D'éirigh leis an Ollamh Sinsearach Jones i gcomórtais chistithe in 2008 freisin: cistíodh a INDEPTH-4 SFI RFP2008 agus chistigh Comhairle Taighde na hÉireann um Eolaíocht, Innealtóireacht agus Theicneolaíocht (IRCSET) Togra Aonair leis i gClár Taighde Comhordaithe TOPO-MED faoi TOPO-EUROPE EUROCORES. Cistíodh beirt Ánra Iardhochtúireachta agus beirt PhD faoin dá thogra seo: in 2009, tosóidh Dr. Jan Vozer agus an tUasal Florian Le Pape ag obair leis an Ollamh Jones ar INDEPTH Céim 4, a scrúdóidh céimseata agus dinimic choimpléascacha coirre thuaidh na hImiléithe; agus tosóidh Dr. Javier Fullea agus Ms. Duygu Kiyan ag obair leis an Ollamh Jones ag scrúdú theicteonaic Mharacó i TOPO-MED, go háirithe an tuairim nach bhfuil screamhfhréamh litisféireach ag Sléibhte Atlais. Anuas air sin, le cistiú inmheánach ón DIAS, d'earcaigh an tOllamh Jones an tUasal Said Gaci don tionscadal PICASSO. Táthar ag súil go mbeidh eochair-ról ag an Uasal Gaci i rath an tionscadail de bharr a aibíochta, agus a chuid taithí sa Sahára thiar, agus tá sé líofa i dteanga na mBeirbearach, san Arabais, sa Fhraincis agus i mBéarla.

During 2008 the search was initiated for a Professor in Geophysics who would commence on the retirement of Assistant Professor Peter Readman in Spring, 2009. It was decided to seek the most gifted person possible in whatever field of Geophysics, with a preference for someone who worked in theoretical and computational aspects to balance the existing strengths of the Section's senior academics. The competition yielded a large and strong field of candidates, and interviews will take place in early 2009 of those short-listed for the position.

In terms of other new faces to the Section in 2008, Assistant Professor Peter Readman brought Ms. Gulten Polat to Dublin to undertake her Ph.D. using the ISLE/ISUM data, funded by Assistant Professor Readman's SFI RFP2007 award. Assistant Professor Brian O'Reilly secured funding from PIPco RSG Ltd. which supports contract scientist Dr. Franz Hauser for one year to work on offshore-onshore seismic data. Mr. David Khoza and Mr. Pieter-Ewald Share started their M.Sc. in the Summer working on SAMTEX under Professor Jones. Both are externally funded, by BHP-Billiton and the South African Council for Scientific and Industrial Research (CSIR) respectively. Experimental Officer Tom Blake, after discussions with DCU in relation to developing DIAS-DCU cooperative scientific activities, employed Grace Campbell as part of the INTRA Programme to help implement the Seismology in Schools (Seismeolaíocht sa Scoil) (SIS) pilot programme roll out.

Dr. Xavier Garcia, the Section's one-and-only Schrödinger Fellow, left the Section in June for a position at the Marine Institute in Barcelona. Collaborations with Dr. Garcia continue through joint projects in SAMTEX and PICASSO, and in new research directions, such as wavelet-based polarization filtering. Dr. Garcia's resignation initiated the search for a successor Schrödinger Fellow to work with Professor Jones. There were delays in this appointment, a competition will be held in early-2009.

COSMOGRID student Anna Avdeeva successfully defended her thesis in February 2008, and together with Dr. Max Moorkamp moved to the German Marine Institute, GEOMAR, in March 2008. Both continued their scientific contact with the Section during the year, with Dr. Max Moorkamp collaborating with Professor Jones and the new Post-Doctoral Fellow, Estelle Roux, and Ph.D. student, Eric Mandolesi, in Joint Inversion of electromagnetic and seismic data on a project funded by Science Foundation Ireland (RFP2008 award to Professor

I rith 2008, cuireadh tús le cuardach Ollaimh sa Geoifisic le dul i gcomharbacht ar an Ollamh Cúnta Peter Readman nuair a d'éirigh sé as in Earrach 2009. Socraíodh go mbeimis ag lorg an duine is ábalta i réimse ar bith den Gheoifisic, ach dá mb'fhéidir é, duine a d'oibrigh le gnéithe teoiriciúla agus ríomhaireachtúla chun cothromaíocht a bhaint amach le láidreachtaí reatha acadóirí sinsearacha na Rannóige. Mheall an comórtas líon ard iarrthóirí fiúntacha agus cuirfear agallamh go luath in 2009 orthu siúd a shroich an gearrliosta don phost.

Maidir le daoine nua eile sa Rannóg in 2008, thóg an tOllamh Cúnta Peter Readman Ms Gulten Polat leis go Baile Átha Cliath chun tabhairt faoina Ph.D. ag baint úsáide as na sonraí ISLE/ISUM, cistithe ag gradam an Ollaimh Chúnta Readman, SFI RFP2007. Fuair an tOllamh Cúnta Brian O'Reilly cistiú ó PIPco RSG Ltd. a thacaíonn leis an eolaí ar chonradh Dr. Franz Hauser obair le sonraí seismeacha amach ar muir–ar tír ar feadh bliana. Thosaigh an tUasal David Khoza agus an tUasal Pieter-Ewald Share ar a gcuid M.Sc. sa Samhradh ag obair faoin Ollamh Jones ar SAMTEX. Tá cistiú seachtrach ag an mbeirt acu, ó BHP-Billiton agus ó Chomhairle na hAifrice Theas um Thaighde Eolaíochta agus Tionscail faoi seach. Tar éis cainteanna le DCU maidir le gníomhaíochtaí eolaíochta comhordaithe idir DIAS-DCU a fhorbairt, d'fhostaigh an tOifigeach Tástála Tom Blake Grace Campbell faoin gClár INTRA chun cabhrú le leathnú amach an chláir Seismeolaíocht sa Scoil.

I mí an Mheithimh, bhog an t-aon Ánra Schrödinger sa Rannóg, an Dr. Xavier Garcia, go dtí post ag Foras na Mara, Barcelona. Leanann comhoibriú leis an Dr Garcia trí chomhthionscadail in SAMTEX agus in PICASSO, agus i dtreoanna taighde nua, mar shampla, scagadh polarú tonnán-bhunaithe. Le héirí as an Dr Garcia, thosaigh cuardach d'Ánra Schrödinger nua le bheith ag obair leis an Ollamh Jones. Moillíodh an ceapachán seo; cuirfear comórtas ar bun go luath in 2009.

D'éirigh le mac léinn COSMOGRID Anna Avdeeva a tráchtas a chosaint i mí Feabhra 2008, agus bhog sí leis an Dr. Max Moorkamp i mí an Mhárta 2008 go dtí Foras Mara na Gearmáine, GEOMAR. Lean siad lena dteagmháil eolaíoch leis an Rannóg i rith na bliana; chomhoibrigh ar Dr. Max Moorkamp leis an Ollamh Jones agus leis an Ánra Iardhochtúireachta nua Estelle Roux, agus le mac léinn Ph.D. Eric Mandolesi, i gComhinbhéartú sonraí leictreamaighnéadacha agus sonraí seismeacha

Jones). Mark Hamilton also successfully defended his thesis in March 2008, and left for EMGS, a Norwegian-based marine electromagnetic company.

Finally, Professor Ben Kennedy was hired as the Co-ordinator for the Irish Geoscience Graduate Programme (IGGP), and commenced in Spring 2008.

2. General Research Activities

The Section held two very successful workshops during 2008, one in the Spring and one in the Autumn. The Section hosted the second St. Patrick's Geophysical Workshop for three days prior to St. Patrick's Day (12-14 March), on the topic Three-Dimensional Inversion of Magnetotelluric Data, and was organized by Ph.D. student Marion Miensopust and Prof. Jones. The website for the workshop is: http://www.dias.ie/mt3dinv/Home.html. Over 25 people attended the workshop, with approx. three-quarters coming from outside Ireland. The first part of the assignment to all workshop attendees comprised comparing forward codes for a described structure, and the second part comprised inverting data from a secret model. The results from the workshop verified certain forward codes. One novel feature of this workshop was that it was webcast, as in the presentations were broadcast in real-time on the internet. Over 50 people came in at various times, with 15 or so watching continuously. The videos of the presentations are available for download from the workshop website.

The 2-day Autumn workshop was organized by Professor Lebedev on Continental Deformation, and took place from 13-14 November 2008. The website is: http://www.dias.ie/continental_deformation/index.htm. Approximately 50 people attended the workshop, with over 30 coming from outside DIAS.

On a national front, Professor Ben Kennedy, former Dean of the Faculty of Science at UCD, was hired through a Griffith award of the Department of Communications, Energy and Natural Resources, administered by the Geological Survey of Ireland, to Professor Jones to initiate the Irish Geoscience Graduate Programme (IGGP). The IGGP is a revolutionary concept in All-Ireland 4th Level education and training that will expose post-graduate students to broad-based geoscience topics through the provision of Short Courses at the appropriate institution, wherever they may be held across the whole of the island of Ireland (North and South). Professor Kennedy holds

i dtionscadal atá cistithe ag Fondúireacht Eolaíochta Éireann (RFP2008 tugtha do Jones). D'éirigh le Mark Hamilton a thráchtas a chosaint freisin, i mí an Mhárta, agus bhog sé go EMGS, comhlacht leictreamaighnéadach mara atá bunaithe san Iorua.

Mar fhocal scoir, fostaíodh an tOllamh Ben Kennedy mar Chomhordaitheoir don Chlár Éireannach Geo-eolaíochta do Chéimithe (IGGP) agus thosaigh sé san earrach.

2. Gníomhaíochtaí Taighde Ginearálta

Bhí dhá cheardlann rathúla ag an Rannóg i rith 2008, ceann amháin san earrach agus ceann eile san fhómhar. D'óstaigh an Rannóg an dara Ceardlann Geoifisice Naomh Pádraig ar feadh trí lá roimh Lá Fhéile Pádraig, ar an ábhar Inbhéartú Tríthoiseach Sonraí Maighnéadaiteallúireach: mac léinn Ph.D. Marion Miensopust agus an tOllamh Jones a d'eagraigh í; suíomh Gréasáin na ceardlainne ná:http://www.dias.ie/mt3dinv/Home.html. D'fhreastail os cionn 25 duine ar an gceardlann, thart ar thrí cheathrú díobh ó thíortha eile. Tugadh tasc dúbailte do na freastalóirí uile: sa chéad chuid, rinne siad comparáidí idir chóid 'chun tosaigh' de struchtúir a tuairiscíodh; sa dara cuid, bhí sonraí le hinbhéartú ó shamhail rúnda. Chruthaigh torthaí na ceardlainne cóid 'chun tosaigh' áirithe. Gné amháin nua den cheardlann ná gur craoladh na léachtaí i bhfíor-am ar an Idirlíon. Tháinig os cionn 50 duine isteach ó am go ham agus d'fhan thart ar 15 duine ag breathnú go leanúnach. Is féidir na físléachtaí a íoslódáil ó shuíomh Gréasáin na ceardlainne.

Ar an 13-14 Samhain 2008, d'eagraigh an tOllaamh Lebedev ceardlann an fhómhair a mhair dhá lá ar an ábhar Dífhoirmiúchán Ilchríochach; suíomh Gréasáin: http://www.dias.ie/continental_deformation/index.htm. D'fhreastail thart ar 50 duine ar an gceardlann, os cionn 30 mar chuairteoirí go dtí an DIAS.

Ag an leibhéal náisiúnta, fostaíodh an tOllamh Ben Kennedy, iarDhéan Dáimhe na hEolaíochta in UCD, trí ghradam Griffith na Roinne Cumarsáide, Mara agus Achmhainní Nádúrtha a riarann Suirbhéireacht Geolaíochta na hÉireann, don Ollamh Jones chun tús a chur leis an gClár Éireannach Geo-eolaíochta do Chéimithe (IGGP). Coincheap réabhlóideach in oideachas agus in oiliúint 4ú-Leibhéal na hÉireann is ea an IGGP a nochtóidh réimse ábhar geo-eolaíochta do mhic léinn iarchéime trí Ghearrchúrsaí in institiúidí cuí, cibé áit a bhfuil siad ar oileán na hÉireann (Thuaidh agus

the position of IGGP Co-ordinator for two years, with the task to develop the initiative through extensive liaising with Faculty and Administrations at Universities across the whole of Ireland (North and South). The IGGP is a product of the Committee of Heads of Irish Geoscience Institutes, which exemplifies and articulates the co-operation that exists across the whole of Ireland in the Geosciences Sector.

On the European research front, TOPO-EUROPE represents the most significant collaboration by European geosciences ever to occur, and Geophysics Section members are fully involved. In breadth and scope TOPO-EUROPE exceeds all prior initiatives, such as EUROPROBE, with its ambitious aim to understand the complex role that mantle dynamics plays in shaping surface topography. The formidable "White Paper" that describes TOPO-EUROPE was published in Global and Planetary Change in 2007 (vol. 58), and the 118 pages of the paper formed the whole issue. In 2007 TOPO-EUROPE was accepted as a European Science Foundation's (ESF) EUROCORES project, and TOPO-MED is one of the successful Coordinated Research Projects within it. TOPO-MED has the broad objective of developing understanding of the tectonics of the Western Mediterranean, and complements PICASSO activities (see below).

On the international front, the Section continued to support the AfricaArray initiative through providing two mentors, Mr. David Khosa and Mr. Pieter-Ewald Share, to the University of the Witwatersrand's Geophysical Field School. The Section will continue to support AfricaArray, which is a unique programme for geophysical research and education in sub-Saharan Africa.

The research activities of the Section continued at the same frenetic pace of the last few years. In total, members of the Section were authors or co-authors on a total of twelve papers published in international journals, and a further eight were submitted for consideration and are in the review process.

3. Specific Research Activities

3.1 Combining seismology and electromagnetism – Professor Jones

Combining seismological and electromagnetic data, both quantitatively and qualitatively, progressed significantly in 2008 through work by Dr Max

Theas). Beidh dhá bhliain ag an Ollamh Kennedy mar Chomhordaitheoir IGGP chun an tionscnamh a fhorbairt trí theagmháil fhorleathan le Dámha agus le Riaracháin Ollscoileanna ar fud na hÉireann (Thuaidh agus Theas). Toradh den Choiste de Cheannairí Institiúidí Geo-eolaíochta Éireannacha is ea an IGGP, a léiríonn agus a chuireann in iúil an comhoibriú atá san Earnáil Geo-eolaíochta ar fud na hÉireann.

Ag leibhéal an taighde Eorpaigh, is é TOPO-EUROPE an comhoibriú is suntasaí idir geo-eolaíochtaí a tharla riamh agus tá baill na Rannóige Geoifisice ag glacadh páirt iomlán ann. Lena aidhm uaillmhianach chun tuiscint a fháil ar an ról coimpléacs atá ag dinimic mhaintlíní i múnlú topagrafaíocht dromchla, sáraíonn TOPO-EUROPE, i bhfairsinge agus i scóip, gach uile thionscnamh roimhe seo, EUROPROBE mar shampla. Foilsíodh an "Páipéar Bán" gríobhach a thugann cur síos ar TOPO-EUROPE in Global and Planetary Change in 2007 (iml. 58), agus líon 118 lch an pháipéir an iris ar fad. In 2007 glacadh le TOPO-EUROPE mar thionscadal EUROCORES de chuid Fhondúireacht Eolaíochta na hEorpa agus tá TOPO-MED ar cheann de na Tionscadail Comhordaithe Taighde rathúla istigh ann. Is é cuspóir leathan TOPO-MED ná tuiscint a fhorbairt ar theicteonaic na Meánmhuirí iartharaigh agus déanfaidh sé gníomhaíochtaí PICASSO a chomhlánú (féach thíos).

Ag an leibhéal idirnáisiúnta, lean an Rannóg ag tacú le tionscnamh AfricaArray trí bheirt mheantóir, an tUasal David Khosa agus an tUasal Pieter-Ewald Share, a sholáthar do Scoil Gheoifisiceach Allamuigh Ollscoil Witwatersrand. Leanfaidh an Rannóg le tacaíocht a thabhairt d'AfricaArray, clár uathúil don taighde geoifisice agus don oideachas san Afraic fho-Shaharach.

Lean gníomhaíochtaí taighde na Rannóige ag ráta fraochta na mblianta beaga anuas. San iomlán, foilsíodh dosaen páipéar le baill foirne, mar údair nó mar chomhúdair, in irisí idirnáisiúnta, agus cuireadh ocht gcinn eile faoi bhráid eagarthóirí agus tá siad fós sa phróiseas athbhreithnithe.

3. Gníomhaíochtaí Taighde Faoi Leith

3.1 Seismeolaíocht agus leictreamaighnéadas a chomhcheangal – an tOllamh Jones

Bhí dul chun cinn suntasach cáilíochtúil agus cainníochtúil maidir le comhcheangal sonraí seismeolaíocha agus leictreamaighnéadacha in 2008 leis an obair a rinne Dr Max Moorkamp agus an

Moorkamp and Dr Estelle Roux with Professor Jones. Before leaving DIAS, Dr Max Moorkamp extended the joint inversion of magnetotelluric (MT) and seismic receiver function (RF) data to include seismic surface waves (SW), whilst through 2008 Estelle Roux extended this approach further to consider models with anisotropic (properties different in the two orthogonal horizontal directions) layers. The basis of the latter assumption is observations, initially rare but now becoming relatively commonplace, that often seismic and electrical anisotropies are parallel, suggesting a common origin for their occurrence. The inversion method uses the so-called Genetic Algorithm (GA) approach, which is a directed random search procedure through model space. GAs are particularly suited to multidimensional global search problems where the search space potentially contains multiple local minima, which is especially a problem when undertaking joint inversion for different properties of the media. Trials by Dr. Estelle Roux on synthetic data are showing promising results, and it is expected that inversions of real data will commence in 2009.

3.2 Magnetotelluric research – Professor Jones

Another very promising research direction is of three-dimensional (3D) inversion of magnetotelluric data including effects due to distortion of the electric fields by small-scale inhomogeneities. This work, by PhD student Marion Miensopust and Prof. Jones, is being undertaken in very close collaboration with Professor Colin Farquharson of Memorial University of Newfoundland. The first step though in any inversion procedure must be to ensure that the forward engine is accurate, and Marion Miensopust compared and contrasted a number of codes for this. On this theme, in the Summer Marion Miensopust spent a month in Newfoundland working with Professor Colin Farquharson in writing and developing a new code from scratch that will be the first to solve both for the internal 3D conductivity structure of the Earth and for the distortions at each observation location.

Research as part of the Southern African Magnetotelluric Experiment (SAMTEX) continued through the activities of Post-Doctoral Fellow Dr. Mark Muller, Ph.D. student Marion Miensopust, M.Sc. students David Khosa and Pieter-Ewald Share,

Dr Estelle Roux leis an Ollamh Jones. Sular fhág sé DIAS, leathnaigh an Dr Moorkamp comhinbhéartú sonraí maighnéadaiteallúireacha (MT) agus sonraí seismeacha ar fheidhm glacadóirí chun tonnta seismeacha dromchla a thabhairt isteach agus i rith 2008 leathnaigh Roux an cur chuige seo níos faide chun breathnú ar shamhlacha le sraitheanna ainiseatrópacha (airíonna atá difriúil in dhá threo chothrománacha). Tá an dara tuiscint seo bunaithe ar bhreathnaithe a bhíodh gann ach atá ag éirí coitianta go leor go mbíonn ainiostrópachtaí seismeacha agus leictreonacha cothrománach go minic, leid go bhfuil foinse choitianta acu. Úsáideann an modh inbhéartúcháin an cur chuige ar a dtugtar Algartam Géiniteach (AG), sin rud a dhíríonn cuardach randamach trí spás samhla. Tá AGanna oiriúnach ach go háirithe d'fhabanna a bhaineann le cuardach uilíoch iltoiseacha áit a bhfuil seans ann go bhfuil íosmhéideanna iolrach logánta sa spás atá á chuardach, atá ina fhadhb faoi leith agus comhinbhéartú á dhéanamh ar airíonna éagsúla na meán. Tá torthaí rathúla ar thrialacha an Dr. Estelle Roux ar shonraí sintéiseacha agus táthar ag súil go dtosóidh inbhéartú ar réadshonraí in 2009.

3.2 Taighde maighnéadaiteallúireach – an tOllamh Jones

Treo taighde eile a bhfuil cuma mhaith air ná inbhéartú tríthoiseach (3T) sonraí maighnéadaiteallúireacha agus iarmhairtí de thoradh dhíchumadh réimse leictrigh ag neamhaonchineálacha mhionscála san áireamh. Tá an obair seo, le mac léinn PhD Marion Miensopust agus leis an Ollamh Jones, á dhéanamh i ndlúthchomhar leis an Ollamh Colin Farquharson, Memorial University, Talamh an Éisc. Is é an chéad rud atá le déanamh in aon nós imeachta inbhéartaithe ná a dheimhniú go bhfuil an t-ineall chun tosaigh beacht, agus chuir Marion Miensopust roinnt cód i gcomparáid agus i gcodarsnacht le cheile dá réir. Ar an téama seo, chaith Marion Miensopust mí i dTalamh an Éisc sa samhradh ag obair leis an Ollamh Colin Farquharson ar scríobh agus ar fhobairt cóid nua ón tús a réiteoidh dhá rud den chéad uair; struchtúr seoltachta inmheánaigh 3T an Domhain agus an díchuma atá ag gach suíomh breathnaithe.

Lean taighde mar chuid de Thurgnamh Maighnéad-aiteallúireach na hAfraice Theas (SAMTEX) trí ghníomhaíochtaí an Ánra Iardhochtúireachta, Dr. Mark Muller, iarrthóir Ph.D. Marion Miensopust,

and Professor Jones. Phase IV acquisition took place during the Spring of 2008 in mostly Botswana and Namibia, and included measurements in the Central Kalahari Game Reserve, an area approx. 75% the size of the island of Ireland but without any logistical support whatsoever and with very testing conditions, such as thick Kalahari sands and dangerous roaming wildlife (lions, hyenas) that required particular attention to logistics and to Health and Safety. Broadband (BBMT) and long period (LMT) magnetotelluric measurements were made at over 150 locations. Thirteen presentations, including three invited keynote presentations, were made on SAMTEX work at international workshops and conferences during the year, and two journal papers were submitted.

The second phase of the PICASSO (Program to Investigate the Cause of the Alboran-AtlaS System convective Overturn) project, due to have taken place in Autumn, 2008, was postponed because of lack of solar activity. Ph.D. student Jan-Philipp Schmoldt and Professor Jones continued their analyses of the 2007 PICASSO data acquired in Spain on a N-S profile from approx. Madrid to Malaga. Although much of the data is of high quality, some is poor due to a combination of low signal activity and high noise levels. To attempt to address this, Jan Schmoldt and Professor Jones will work with Dr. Xavier Garcia to develop a revolutionary new approach of noise cancellation using wavelet-based polarization filtering.

The LAPIS project, which is a study of the internal structure of the island of La Palma using high-frequency audio-magnetotellurics (AMT), was completed and results submitted to an international journal for publication. The goal of this project is to explore and map the western flank of the island to understand the evolution of the island and map a potentially unstable block that, if released, would generate a catastrophic tsunami wave that would engulf much of the northern Atlantic. The results from this project show a 1 km thick structure on the western flank that correlates well with one mapped by geologists using surface information. Further work needs to be undertaken, especially of the logistically difficult and inaccessible eastern half of the island.

iarrthóirí M.Sc. David Khosa agus Pieter-Ewald Share, agus an Ollaimh Jones. Tharla Céim IV den chlár fála in earrach 2008, sa Bhotsuáin agus sa Naimib go príomha; agus rinneadh tomhais in Anaclann Ghéime an Kalahari Láir, ceantar atá thart ar 75% d'achar oileán na hÉireann ach gan tacaíocht lóistíochta ar bith ann agus le coinníollacha deacra ann, gainimh tiubha agus ainmhithe fiáine ar fánaíocht (leoin, hiénaí) mar shampla, agus bhí gá ann aird faoi leith a dhíriú ar lóistíocht agus ar Shláinte agus Sábháilteacht. Rinneadh tomhais leathanbhanda (BBMT) agus tomhais maighnéadaiteallúireacha fadtréimhseacha ag breis is 150 áit. I rith na bliana, cuireadh trí léacht déag i láthair, trí eochairléacht san áireamh, ar obair SAMTEX ag ceardlanna agus comhdhálacha idirnáisiúnta agus seoladh dhá pháipéar irise isteach.

Bhí céim a dó de thionscnamh PICASSO (clár chun an chúis atá leis an aisiompú dronnach sa Chóras Alborach-Atlas a scrúdú) le tosú san fhómhar ach cuireadh siar é de dheasca easpa grianghníomhaíochta. Lean iarrthóir Ph.D. Jan-Philipp Schmoldt agus an tOllamh Jones lena n-anailís ar shonraí PICASSO 2007 a fuarthas sa Spáinn ar phróifíl Thuaidh-Theas ó thart ar Maidrid go Malaga. Cé go bhfuil go leor de na sonraí ar ardchaighdeán, tá cuid díobh lochtach de bharr comharthaí gníomhaíochta ísle agus leibhéil arda fuaime. Chun dul i ngleic leis seo, comhoibreoidh Jan Schmoldt agus an tOllamh Jones leis an Dr. Xavier Garcia chun bealach réabhlóideach nua cealú fuaime a fhorbairt ag úsáid scagadh polarú tonnán-bhunaithe.

Cuireadh críoch leis an tionscadal LAPIS le struchtúr inmheánach oileán La Palma a scrúdú le clostrealamh mhaighnéadaiteallúireacha am. Cuireadh na torthaí chuig iris idirnáisiúnta le foilsiú. Is é aidhm an tionscadail seo ná cliathán iartharach an oileáin a iniúchadh agus a mhapáil le héabhlóid an oileáin a thuiscint agus chun bloc a mhapáil a d'fhéadfadh a bheith chomh héagobhsaí sin, dá dtitfeadh sé, go slogfadh tonn ollmhór súnámaí cuid mhór den Atlantach Thuaidh. Léiríonn torthaí an tionscadail seo struchtúr tiúis 1 km ar an gcliathán iartharach a réitíonn go maith le ceann a mhapáil geo-eolaithe ag baint úsáide as sonraí an dromchla. Is gá breis oibre a dhéanamh, go háirithe ar leath oirthearach an oileáin atá doshroichte agus a bhfuil deacrachtaí lóistíochtúla le sárú ann.

3.3 Seismological research – Professor Lebedev

The study of the history of deformation beneath the East-central United States has been completed by F. Deschamps (ETH Zurich), Professor Lebedev and collaborators. Seismic analysis has revealed that the lithosphere and asthenosphere beneath the south-Appalachian region comprise three layers with distinctly different anisotropic fabric within each. The fabric within the different layers has been formed by deformation and flow of the crustal and mantle rock at different times, from the time of the rise of the mountains, over 250 m.y. ago, to the present. The results of seismic analysis and the implications for the deep dynamics of tectonic plates have been published in two papers in international journals (Geophys. J. Int. 2008; Earth Planet. Sci. Lett. 2008) and presented at international conferences.

The study of the deep seismic structure and deformation of the Aegean region was continued by B. Endrun (U. Potsdam), Professor Lebedev and T. Meier (Bochum). Deep deformation patterns inferred from seismic analysis suggested that the mechanism of extension in this active tectonic area involved viscous-fluid-like flow of the hot rock in the lower crust and lithospheric mantle. A paper on the isotropic seismic structure of the region has been published in an international journal (Geophys. J. Int. 2008); on-going research on the mechanism of the lithospheric extension has been presented at conferences.

Seismic study of the ancient, Precambrian lithosphere has been continued and expanded. Professor Lebedev and collaborators have finished a global-overview study of cratons (ancient cores of continents) using broad-band measurements of surface-wave dispersion. Seismic profiles from cratons around the world confirmed the presence of cold, thick lithospheric roots beneath them and, also, suggested that phase transformations in mantle minerals are spread over broad depth intervals within the roots. Radial anisotropy was also measured, with inferences regarding the dynamics of the formation and stabilisation of cratons billions of years ago. The work was published online in Lithos Special Issue in 2008 (to appear in print in 2009) and presented at conferences. Joanne Buckenmeyer has started a Ph.D. project on seismic structure and evolution of

3.3 Taighde seismeolaíochta – an tOllamh Lebedev

Tá an staidéar ar stair an dífhoirmiúcháin faoi SAM Láir Thoir curtha i gcrích ag F. Deschamps (ETH Zurich), an tOllamh Lebedev agus comhoibreoirí. Léirigh anailís sheismeach go bhfuil an litisféar agus an t-astanaisféar faoin reigiúin Apaláiseach Theas comhdhéanta de thrí shraith le fabraic ainiseatrópach dhifriúil faoi leith i ngach ceann acu. Foirmíodh faibric na sraitheanna éagsúla trí dhífhoirmiú agus shreabhadh na screamhcharraigeacha agus na forscreimhe, ó ardú na sléibhte os cionn 250 m. bliain ó shin go dtí an lá inniu. Foilsíodh torthaí na hanailíse seismí agus a n-impleachtaí le haghaidh na dinimice doimhne in dhá pháipéar in irisí idirnáisiúnta (Geophys. J. Int. 2008; Earth Planet. Sci. Lett. 2008) agus cuireadh i láthair iad ag comhdhálacha idirnáisiúnta.

Lean B. Endrun (Ollscoil Potsdam), an tOllamh Lebedev agus T. Meier (Bochum) leis an staidéar ar struchtúir domhain seismeach réigiún na Mara Aeigéiche. Infeiríodh pátrúin difhoirmithe dhoimhne ón anailís sheismeach agus thug siad leid go raibh baint ag sreabhadh a bhí cosúil le sreabhán slaodach na carraige the sa screamh íochtair agus sa mhaintlín liteasféarach le meicníocht an fhairsingithe sa réigiúin teicteonach gníomhach. Foilsíodh páipéar ar struchtúr seismeach iseatrópach an réigiúin in iris idirnáisiúnta (Geophys. J. Int. 2008) agus cuireadh taighde leanúnach ar mheicníocht an fhairsingithe liteasféarach i láthair ag comhdhálacha.

Leanadh leis agus forbraíodh an staidéar ar an liteasféar ársa Réamhchaimbríoch. Chríochnaigh an tOllamh Lebedev agus comhoibreoirí staidéar forbhreathnuithe domhanda ar chratóin (croíthe ársa ilchríoch) ag baint úsáide as tomhais leathanbhanda de spré tonnta dromchla. Dhearbhaigh próifílí seismeacha as cratóin timpeall an domhain go bhfuil fréamhacha fuara tiubha liteasféaracha futhu agus thug siad leid freisin go bhfuil céimeanna trasfhoirmithe i mianracha maintlíní scaipthe thar dhoimhneacht eatramh leathana taobh istigh de na fréamhacha. Tomhasadh anaiseatrópacht ghathach freisin le hinfeiris do dhinimic fhoirmíochta agus do chobhsúcháin chratón na billiúin de bhlianta ó shin. Foilsíodh an obair ar líne in eagrán speisialta de Lithos in 2008 (le cur i gcló in 2009) agus cuireadh i láthair é ag comhdhálacha. Thosaigh Joanne Buckenmeyer ar thionscadal Ph.D. ar struchtúr agus ar éabhlóid sheismeach liteasféar na hAfraice Theas i mí Dheireadh

South African lithosphere in October 2008. South Africa has been studied extensively using various geological and geophysical techniques (including MT in the project SAMTEX, above). Multidisciplinary analysis of the expected seismic results should produce new insight into the structure and evolution of continents.

A two-pronged, SFI-funded study of the active deformation of continents has also been initiated (Professor Lebedev). Within the seismology component of the research, Matthew Agius has started a Ph.D. project on the seismic study of Tibet. The geodynamic component will be spearheaded by the new Post-Doctoral Fellow, to join in early 2009, and done in collaboration with geodynamics experts in Europe and the U.S.

3.3 Seismological research – Assistant Professor Brian O'Reilly and Assistant Professor Peter Readman

Under PIMS (Porcupine Irish Margin Seismics), further work on modelling and interpretation of the data has been concentrated on the Irish continental shelf and the transition into the Porcupine Basin in order to interpolate the onshore structure seawards. The modelling strategy uses a-priori knowledge built up from past DIAS onshore and offshore seismic experiments, i.e. VARNET and RAPIDS 4. A particular focus of the work was the axial line. This part of the work will hopefully delineate the southern extent of the feature known as the Porcupine Arch, interpreted from the results of the RAPIDS 4 project as exhumed serpentinised mantle. It will also provide crucial information on the sedimentary architecture of a region previously unknown using conventional industrial seismic acquisition techniques.

A comprehensive series of investigations of the fine-scale seismic structure of the upper lithosphere, within the region that straddles the Iapetus Suture Zone, were carried out during 2008. The results of these studies were submitted as two papers for publication in the later part of the year.

The seismic modelling results of HADES (Hatton Deep Seismic) from the transverse line across the Hatton Basin and Hatton Continental Margin (Profiles 1 and 2) were integrated with those from the axial line in the Hatton Basin (Profile 3). Results from the seismic interpretation were integrated with

Fómhair 2008. Tá staidéar fairsingíoch déanta ar an Afraic Theas ag baint úsáide as teicníochtaí geolaíocha agus geoifisiceacha (MT sa tionscadal SAMTEX san áireamh, thuas). Nuair a gheofar na torthaí seismeacha ba chóir go soláthróidh anailís idirdhisciplíneach léargas nua ar struchtúr agus eábhlóid ilchríoch.

Tá tús curtha chomh maith le staidéar dhá chuid ar dhífhoirmiú ilchríoch, cistithe ag Fondúireacht Eolaíochta Éireann (an tOllamh Lebedev). Sa chuid sheismeach den taighde, thosaigh Matthew Agius ar staidéar seismeach na Tipéide mar thionscadal Ph.D. Beidh cuid na geoidinimice faoi Ánra Iardhochtúireachta nua, a thiocfaidh ar bord go luath in 2009, agus déanfar é i gcomhoibriú le saineolaithe geoidinimice san Eoraip agus i SAM.

3.3. Taighde Seismeolaíoch – an tOllamh Cúnta Brian O'Reilly agus an tOllamh Cúnta Peter Readman

Faoi PIMS (Seismic Imill na hÉireann den Torcán Craobhach) bhí tuilleadh oibre déanta ar shamhaltú na sonraí agus ar chiall a bhaint astu chun díriú ar scairbh ilchríochach na hÉireann agus an tslí a dtéann sí isteach in Imchuach an Torcáin Chraobhaidh d'fhonn an struchtúr ar tír a idirshuigh amach san fharraige. Baineann an straitéis samhaltaithe úsáid as eolais a-priori cnuasaithe ó thurgnaimh sheismeacha a rinne DIAS cheana féin ar tír agus ar muir, .i. VARNET agus RAPIDS 4. Fócas faoi leith den obair ba ea an líne aiseach. Táimid dóchasach go rianóidh an chuid seo den obair fairsinge ó dheas an ghné ar a dtugtar Áirse an Torcáin Chraobhaigh, gur féidir ciall a bhaint as torthaí an tionscadail RAPIDS 4 mar mhaintlín lúbach athnochta. Soláthróidh sé freisin eolas ríthábhachtach ar ailtireacht dhríodach réigiúin nach raibh fáil air roimhe seo le gnáth-theicníochtaí tionsclaíocha fála seismeacha.

Rinneadh sraith chuimsitheach iniúchtaí i rith 2008 ar struchtúr seismeach ar scála mín den litisféar uachtarach sa réigiún sin atá ina suí ar an dá thaobh den Uaimchrois Iapetus. Cuireadh torthaí na staidéar seo faoi bhráid eagarthóirí mar dhá pháipéar le foilsiú sa dara leath den bhliain.

Comhtháthaíodh torthaí samhaltaithe HADES (Domhain Sheismeach Hatton) ón líne thrasnach trasna Imchuach Hatton agus Imeall Ilchríochach Hatton (Próifílí 1 agus 2) leo siud ón líne aiseach in Imchuach Hatton (Próifíl 3). Baineadh ciall sheismeach as na torthaí agus comhtháthaíodh iad le sonraí loga tobair

sonic and lithological well-log data from DSDP and ODP boreholes close to, or coincident with, the high resolution Irish National Seabed Survey / Rockall Consortium (comprising the British Geological Survey and the Irish Shelf Petroleum Studies Group) vertical reflection data and the HADES wide-angle seismic profiles.

The ISLE project, for seismological studies of the Iapetus suture which closed the Iapetus ocean that separated northern Ireland from southern Ireland, continued with the ISLE-2 (ISUME, Irish Seismic Upper Mantle Experiment) funded by SFI RFP2007. The ISUME project began in October 2008 with the recruitment of a PhD student, and data collection continued with the servicing and redeployment of some of the stations in more strategic positions. Analysis of suitable data gathered since 2006 for further SKS/SKKS splitting analysis was started in the later part of the year.

A new project called NAPSA, for the North Atlantic Petroleum Systems Assessment group, was initiated with the objective to investigate and compare the crustal structure of the conjugate north Atlantic margin regions of Newfoundland and Ireland using potential field data and innovative modelling techniques. This project will build upon the large amount of experience accumulated in DIAS and UCD. The Irish – Newfoundland Partnership of the Department of an Taoiseach is involved and provided seed funding to discuss research initiatives and objectives together with the Petroleum Affairs Division of the Department of Communications and Natural Resources.

3.4 Geodynamic modelling – Assistant Professor Brian O'Reilly and Assistant Professor Peter Readman

Detailed analysis and interpretation of the results of analogue modelling conducted during the previous year in Amsterdam and Florence, was completed. A detailed comparative numerical study of "crustal" features observed in the analogue models was undertaken and the results compared with those observed in the natural prototype, i.e. from the RAPIDS 4 experiment in the Porcupine Basin.

3.5 Seismic network – Tom Blake

The two broadband seismic network stations, namely DSB in the Dublin mountains and VAL at the Met Éireann Valentia Observatory, operated well in

sonach agus liteolaíoch ó na tollphoill DSDP agus ODP i ngiorracht do, nó comhthitimeach le sonraí ardtaifeacha frithchaithimh ingearach Shuirbhéireacht Náisiúnta Ghrinnill na hÉireann / Chuibhreannais Rocail (Suirbhéireacht Gheolaíoch na Breataine móide Grúpa Staidéar Peitriliam Scairbhe na hÉireann) agus le próifílí leathanuilleacha seismeacha HADES.

An tionscadal ISLE le haghaidh staidéar seismeach ar an uaim Iaipéitis a dhún an tAigéan Iaipéitis idir thuaisceart agus deisceart na hÉireann lean siad ar aghaidh le ISLE-2 (ISUME: turgnamh Éireannach seismeach ar an maintlín uachtarach) cistithe ag SFI REP2007. Thosaigh ISUME i mí Dheireadh Fómhair 2008 le hearcú mac léinn PhD agus lean bailliú sonraí le seirbhísiú agus le hathlonnú cuid de na stáisiún i suíomhanna níos straitéisí. Go déanach sa bhliain thosaigh anailís ar shonraí oiriúnacha a bailíodh ó 2006 i leith le haghaidh tuilleadh anailíse ag scartha SKS/SKSS

Cuireadh tús le tionscadal nua, NAPSA, ainmnithe don ghrúpa measúnóirí ar chórais peitriliam an Atlantaigh Thuaidh, leis an gcuspóir struchtúr scaire screimhe na réigiún ar imeall thuaidh an Atlantaigh de Thalamh an Éisc agus d'Éirinn a scrúdú agus a chur i gcomparáid, ag baint úsáide as sonraí allamuigh féideartha agus teicnící samhaltaithe nuálacha. Tógfaidh an tionscadal seo ar an taithí mhór atá ag DIAS agus UCD. Tá Comhpháirtíocht na hÉireann – Thalamh an Éisc de Roinn an Taoisigh páirteach ann agus sholáthair sé cistiú síl le tionscnaimh agus cuspóirí taighde a phlé leis an Rannóg Gnóthaí Peitriliam den Roinn Cumarsáide agus Achmhainní Nádúrtha.

3.4 Samhaltú geoidinimice – an tOllamh Cúnta Brian O'Reilly agus an tOllamh Cúnta Peter Readman

Críochnaíodh mionanailís ar thorthaí an samhaltaithe analógaigh a rinneadh an bhliain roimhe sin in Amstardam agus i bhFlórans agus baineadh ciall as na torthaí sin. Rinneadh mionchomparáid uimhriúil ar ghnéithe 'screimhe' a breathnaíodh sna samhlacha analógacha agus rinneadh comparáid leo siúd a breathnaíodh sa fhréamhshamhail nádúrtha, .i. ón tionscnamh RAPIDS 4 in Imchuach an Torcáin Chraobhaigh.

3.5 Líonra seismeach – Tom Blake

D'oibrigh an dá stáisiúin leathanbhandacha sheismeacha go maith in 2008, .i. DSB i Sléibhte Átha Cliath agus VAL ag Réadlann Met Éireann, Dairbhre, ag tuairisc sonraí réad-ama trí nasc Idirlín isteach sa

2008 reporting data in real-time through internet connection into DIAS, and were further transmitted to Potsdam for inclusion in the global GEOFON network for automatic earthquake event location determination. The National Tsunami Warning System is on hold, which paralyzes the efforts in that direction to obtain funding for a modern seismic network for Ireland.

4. Outreach

The Seismology in Schools (Seismeolaiocht sa Scoil) (SIS) pilot programme roll out began in earnest in 2008. Following the development of a rigorous implementation plan the induction of teachers into the SIS programme around the country continued throughout the year. The facilities to hold these teacher workshops were provided by the six Education Centres in Dublin West, Dún Laoghaire, Cork, Ballina, Wexford and Portlaoise. There were follow-up visits throughout the year to all the schools in the programme to evaluate the effectiveness of the rollout and the extent to which the implementation had progressed in the schools by the teachers. Local factors determine the extent to which the programme can be implemented and issues such as computer availability, existing school eco awareness programmes as it effects power consumption, and staffing issues meant that not all schools have developed to the same level.

The SIS programme received significant publicity as a result of the Sichuan, China Earthquake of May 12th, 2008. This earthquake had a magnitude 7.8 Richter Scale and the associated shock waves were picked up by Scoil Chonglais, Baltinglass, Co Wicklow, who had just joined the Seismology in Schools (Seismeolaíocht sa Scoil) (SIS) pilot programme. There was substantial reporting in the national and local print media of the success of the students, their teacher and the school. Participation by DIAS in the BTYSE in the RDS in Jan 2008 in association with GSI to launch International Year of Planet Earth, meant that DIAS was also able to showcase the Seismology in Schools (Seismeolaíocht sa Scoil) (SIS) pilot programme to a captive audience of young scientists. This had a significant bearing in increasing public awareness of the programme throughout the schools.

DIAS agus ar aghaidh ansin chuig Potsdam lena gcur sa líonra domhanda GEOFON d'fhonn teagmhais creathanna talún a aimsiú go huathoibríoch. Tá Córas Náisiúnta Rabhaidh Súnámaí curtha ar feitheamh, rud a chuireann stad le hiarrachtaí sa treo sin chun cistiú a fháil le haghaidh líonra seismeach nua-aimseartha d'Éirinn.

4. For-rochtain

Tosaíodh i ndáiríre ar leathnú amach na scéime píolótaí Seismeolaíocht sa Scoil (SSS) i 2008. Tar éis plean dian a fhorbairt chun í a chur i ngníomh, lean ionduchtú oidí isteach sa chlár SSS ar feadh na bliana ar fud na tíre. Sholáthair na sé Ionad Oideachais i mBaile Átha Cliath Thiar, i nDún Laoghaire, i gCorcaigh, i mBéal an Átha, i Loch Garmain agus i bPort Laoise na saoráidí do na ceardlanna d'oidí. Tugadh cuairteanna leantacha ar gach scoil sa chlár i rith na bliana chun éifeacht an leathnaithe amach agus chun cur chun cinn an chláir ag múinteoirí sna scoileanna a mheas. Déanann tosca áitiúla cinneadh ar chur chun cinn an chláir agus níl an fhorbairt chéanna bainte amach sna scoileanna uile de bharr na rudaí seo: fáil ar riamhairí, cláir feasachta chomhshaoil sa scoil cheana féin (ó thaobh impleachtaí an chláir d'ídiú cumhachta), agus cúrsaí foirne.

Fuair clár SSS poiblíocht shuntasach de bharr chrith talún Sichuan sa tSín ar an 12 Bealtaine 2008. Bhí méid 7.8 ar Scála Richter aige agus taifeadadh a thonnta turrainge i Scoil Chonglais, Bealach Conglais, Co. Chill Mhantáin, scoil a bhí díreach tar éis teacht isteach sa chlár SSS. Bhí cur síos suntasach sna nuachtáin náisiúnta agus áitiúla ar bhua na mac léinn, a n-oide agus an scoil. De bharr DIAS a bheith páirteach sa BTYSE san RDS i mí Eanáir 2008 chun Bliain Idirnáisiúnta an Domhain a sheoladh i bpáirt le SFI, fuair DIAS an deis chun sárthaispeántas den chlár píolótach Seismeolaíocht sa Scoil a thabhairt do lucht éisteachta d'eolaithe óga nárbh fhéidir leo éalú. Chabhraigh sé seo go suntasach le feasacht phoiblí faoin gclár a mhéadú trí na scoileanna.

5. Training

During 2008 we held a 5-day Short Course on Magnetotellurics in DIAS (http://www.dias.ie/lang/en/cosmic/geo/mt_winglink_course.html). These courses are primarily designed for the benefit of members of the Geophysics Section, but we offer spare "seats" to Irish and European colleagues. Sufficient interest was expressed that the Short Course was moved from Merrion Square to Burlington Road and held in the lecture room.

In addition, Geophysics students have been attending the Summer of Applied Geophysical Experience (SAGE) field school, and 2008 was no exception with Jan Schmoldt going. SAGE is a three-week long school based in Santa Fe during which students are exposed to almost all geophysical techniques. SAGE is partially-supported by a grant from the U.S. National Science Foundation (NSF), and permission for attendance by DIAS Geophysics students is a very welcome privilege.

5. Oiliúint

Bhí Gearrchúrsa 5-lá ar an Maighnéadaiteallúireacht againn in 2008 (http://www.dias.ie/lang/en/cosmic/geo/mt_winglink_course.html). Ullmhaítear na cúrsaí seo go príomha chun go mbainfidh baill na Rannóige Geoifisice leas astu ach tairgfimid 'suíocháin' do chomhghleacaithe Éireannacha agus Eorpacha. Bhí dóthain spéise ann gur bogadh an Ghearrchúrsa ó Chearnóg Mhuirfean go dtí an seomra léachta i mBóthar Bhurlington.

Anuas air sin, bíonn freastal á dhéanamh ag mic léinn Geoifisice ar an scoil allamuigh Samhraidh a bhaineann le Taithí na Geoifisice Feidhmí (SAGE) agus níorbh aon eisceacht í 2008: d'fhreastail Jan Schmoldt air. Cúrsa trí seachtaine lonnaithe i Santa Fe is ea SAGE, ina nochtar beagnach gach uile theicníocht geoifisice do na mic léinn. Faigheann SAGE a chistiú i bpáirt ó Fondúireacht Eolaíochta Náisiúnta SAM (NSF) agus is pribhléid mhór fháilteach go ligtear do mhic léinn DIAS freastal air.

School of Theoretical Physics
Scoil na Fisice Teoiriciúla

In a time of economic crisis, research funding comes under particular scrutiny. Why should Ireland get involved with CERN, just because it is the world-wide leader in the search for the fundamental laws of nature? What have the publicly funded researchers done to avert or mitigate the effect of the present crisis? Our modest attempt will be mentioned below. Has research funding paid off or was it money thrown out of the window? We think that the modest support we obtained was put to good use. More specifically, what is the use of string theory, non-commutative geometry or quantum information? In prosperous times it is easy to state that high quality research will eventually pay off, often in unexpected ways, and this answer remains valid with respect to crises. Take the example of string theory: Strings are one-dimensional objects, and when their change in time is considered, one needs to study two-dimensional physics. The specific theory which had to be investigated for this purpose is conformal quantum field theory in two dimensions. This theory then had applications in a much more down-to-earth situation, namely the behaviour of materials of molecular thickness, which are essentially two-dimensional. In particular, the string-inspired analysis led to the prediction of certain collective excitations which are ideal for quantum computation. It now seems that they have been seen in an experiment.

Quantum computation will come too late to have relevance for the current downturn, but it may well be an important tool to fight the impact of the bigger crises which will be the inevitable consequence of global warming. Unfortunately, this type of work has to be done well in advance. Scientists have called the attention of politicians to global warming for more than 30 years. We had some success, but very little has been done. With timely action, global warming could have been averted, saving much more money than the cost of the present crisis, but after so many wasted years even the new US government can only try to avoid the worst and to mitigate the consequences. Unfortunately, recent research on climate change indicates that greenhouse warming will be in the most severe part of the range of possibilities first considered by the IPCC (Intergovernmental Panel on Climate Change). One of the greatest dangers is the emergence of epidemics, due to the fact that germs which currently only exist in small pockets of the tropics will be able to thrive in large parts of the world. Drug development will have to be rapid and efficient to cope with their spread and their mutations. Present methods of drug development involve a lot of trial and error and are too time-consuming. In principle much of the trial and error could be replaced by computation, but the relevant

I ngéarchéim gheilleagrach déantar scrúdú ar leith ar chistiú taighde. An leor é gur ceannaire domhanda ar lorg dhlíthe bunúsacha an nádúir é CERN go mbeadh Éire páirteach ann? Cad atá déanta ag taighdeoirí atá maoinithe as cistí poiblí chun an ghéarchéim seo a choinneáil uainn nó a laghdú? Luafar ár n-iarracht measartha ar ball. Arbh fhiú an cistiú taighde, nó an caiteachas amú a bhí ann? Táimid den tuairim gur úsáideadh go tairbhiúil an tacaíocht airgid mheasartha a fuaireamar. Níos sainiúla, cad is fiú teoiric na dteaghrán, céimseata neamh-inmhalartaithe, nó faisnéis chandamach? I dtréimhsí rathúla is eásca a rá go n-íocfaidh taighde ardchaighdeáin as féin ar ball, go minic ar bhealaí gan choinne, agus is freagra bailí é seo maidir le géarchéimeanna freisin. Tóg teoiric na dteaghrán mar shampla: is rudaí aontoiseacha iad teaghráin agus nuair a dhéanfaimid machnamh ar a n-athruithe in am, caithimid an fhisic dhéthoiseach a scrúdú. Sa chás seo, ba í an teoiric faoi leith a bhí le scrúdú ná an réimsetheoiric chomhfhoirmiúil chandamaigh in dhá thoise. Bhí feidhmeanna ag an teoiric seo ansin, i., iompraíocht ábhair de thiúis móilíneach atá déthoiseach go bunúsach. Go háirithe, ón anailís a spreag teoiric na dteaghrán, tuaradh comhfhloscthaí áirithe atá idéalach don ríomhaireacht chandamach. Anois, de réir dealraimh, breathnaíodh iad i dturgnamh.

Beidh an ríomhaireacht chandamach ródhéanach don chor chun donais reatha ach b'fhéidir go mbeidh sé ina uirlis troda úsáideach i gcoinne na ngéarchéimeanna méadaithe a thiocfaidh mar thoradh dosheachanta ar an téamh domhanda. Ar an drochuair, caithfear an cineál oibre seo a dhéanamh i bhfad roimh ré. Tá eolaithe ag díriú aird na bpolaiteoirí ar an dtéamh domhanda le breis is tríocha bliain. D'éirigh linn go pointe áirithe ach tá fíorbheagán déanta. Le gníomhaíocht thráthúil, d'fhéadfaí an téamh domhanda a choinneáil uainn, agus i bhfad níos mó airgid ná costas na géarchéime reatha a shábháil; ach tar éis an oiread sin de bhlianta a bheith curtha amú, ní féidir fiú le rialtas nua SAM ach iarraidh an chuid is measa a sheachaint agus an titim amach a laghdú. Ar an drochuair, léiríonn an taighde ar an athrú aeráide le gairid go mbeidh an téamh domhanda sa réimse is measa de na féidearthachtaí a rinne an Painéal Idir-Rialtasach ar an Athrú Aeráide a chéad mhachnamh orthu. Tá teacht chun cinn eipidéimí ar cheann de na contúirtí is mó toisc go mbeidh frídíní nach maireann faoi láthair ach amháin i bpócaí beaga sa Teochrois faoi bhláth i réimsí leithne den domhain. Chun déileáil lena leathadh agus lena gclaochluithe, caithfear drugaí a fhorbairt go tapa agus go héifeachtach. Caitear an iomad ama i bhforbairt drugaí faoi láthair le modhanna trialach agus earráide. I bprionsabal, d'fhéadfadh ríomhaireacht fáil réidh le go leor den triail

chemistry consists of very complicated quantum mechanics. Present day computers are too slow and not well equipped for this task, since they have to imitate delicate quantum mechanical processes with crude devices deafened by thermal noise. In the future it may well be self-evident that all but the simplest quantum mechanical processes have to be calculated by devices which are sensitive to quantum effects, i.e. by quantum computers.

"We are just at the beginning of exploring 95% of the universe." Prof. Nahm (DIAS) introduces the Statutory Public Lecture by Prof. Rolf-Dieter Heuer, Director General of CERN.

"Táimid díreach ag an tús ag taiscéaladh 95% na cruinne." Cuireann an tOll. Nahm (DIAS) tús leis an Léacht Phoiblí Reachtúil le Prof. Rolf-Dieter Heuer, Ard-Stiúrthóir CERN.

Even in the present gloom one should add that such computers will have many uses in a prosperous context, from material science to biology. The problem for quantum computers is just that our world is full of thermal noise, which kills any computational step in nanoseconds. It may be possible to shield against that noise, but this is an extremely difficult task and no success is in sight. A different technology called topological quantum computation has a good chance to be ready before the shielding problem is solved. It needs no shield, because the damage done by thermal noise is limited in one respect – molecules in thermal motion hit randomly at anything in their neighbourhood, but they cannot make a coordinated attack against extended structures. The extended topological structures called non-abelian anyons which are predicted by the string-inspired analysis are completely immune to random hits.

Not every predicted peculiar state of matter has survived a reality check, of course, and without experimental confirmation no progress is possible. A first property which is relatively easy to check is the fractional electric charge of these structures. Indeed any local excitation can only have an integer multiple of the electron charge e, fractional charges can only come about by precisely coordinated

agus earráid seo ach tá meicnic chandamach an-chasta sa cheimic ábhartha. Tá ríomhairí ár linne rómhall agus ní féidir leo an gnó seo a dhéanamh go maith toisc go gcaithfidh siad aithris a dhéanamh ar phróisis fhineálta chandamacha mheicniúla le gléasanna garbha atá bodhraithe ag torann teirmeach. Amach anseo, seans go mbeidh sé follasach ann féin go gcaithfí próisis an mheicnic candamaí (seachas na cinn is simplí) a ríomh le gléasanna atá íogair d'iarmhairtí chandamacha, .i. le ríomhairí candamacha.

Fiú sa ghruaim gheilleagrach faoi láthair, ba chóir a lua go mbeidh a lán feidhmeanna ag a leithéid de ríomhairí i gcomhthéacs rathúil,ó eolaíocht ábhartha go bitheolaíocht. Is í an fhadhb le ríomhairí candamacha ná go bhfuil ár ndomhan lán de thorann teirmeach a mharaíonn aon chéim ríomhaireachta i nanasoicindí. Seans gur féidir sciath a dhéanamh in aghaidh an torainn seo ach sin tasc an-deacair agus is i bhfad ó réiteach na faidhbe sin fós. Sula réiteofar fadhb na scéithe, tá seans maith go mbeidh teicneolaíocht eile ar fáil, ríomhaireacht chandamach thoipeolaíoch. Níl aon ghá le sciath léi mar cuirtear srian leis an damáiste ó thorann teirmeach ar bhealach amháin – buaileann móilíní i ngluaisne theirmeach go randamach i gcoinne rud ar bith atá gar dóibh ach ní féidir leo ionsaí comhordanaithe a dhéanamh ar struchtúir shínte. Tugtar an t-ainm ainiain neamhaibéalacha ar na struchtúir shínte thoipeolaíochta atá tuartha ag an anailís a spreag teoiric na dteaghrán, agus tá na struchtúir seo go hiomlán slán ó bhuillí randamacha.

Dar ndóigh, ní mar a thuartar a bhítear i gcónaí i gcás riocht ábhair aistigh, agus ní féidir dul chun cinn ar bith a dhéanamh gan deimhniú turgnamhach. Airí bunúsach atá éasca go leor a dheimhniú ná lucht leictreach codánach na struchtúr seo. Go deimhin, caithfidh aon fhloscadh áitiúil iolraí slánuimhreach den leictreoin luchtaithe e a bheith aige, ní tharlaíonn luchtanna codánacha ach amháin trí iomlaoid chomhordanáidithe dá lán leictreon. Chonaic turgnamhaithe ag Ollscoil Stony Brook lucht codánach den chéad uair i 1995, is é sin e/3. Fionnachtain thábhachtach ba ea í sin ach tá na floscthaí chomhfhreagracha aibéalach agus róshimplí mar sin don ríomh candamach. I 2008 scrúdaigh turgnamhaithe ag Bell Labs, Alcatel-Lucent córas speisialta déthoiseach agus d'aimsigh siad floscthaí le lucht e/4, leid an-láidir lena n-iompraíocht neamhaibéalach. Ag an tús, bhí an léirmhíniú seo i bhfad ó bheith deimhneach ach léirigh an turgnamh dóthain gnéithe aisteacha gurb fhéidir anailís theoiriciúil a dhéanamh orthu. Thug W. Bishara agus K. Shtengel ó Caltech, P. Bonderson agus C. Nayak ó Microsoft Research, agus Joost Slingerland ónár Institiúid faoin anailís seo. Rinne siad cás an-láidir go bhfacthas ainiain neamhaibéalacha.

fluctuations of many electrons. A fractional charge, namely e/3 was first seen by experimenters at Stony Brook University in 1995. This was an important discovery, but the corresponding excitations are abelian, thus too simple for quantum computation. In 2008 experimentalists at Bell Labs, Alcatel-Lucent studied a special two-dimensional system and discovered excitations with charge e/4 which are very strong candidates for non-abelian behaviour. Initially this interpretation was far from certain, but the experiment showed enough peculiar features to be amenable to theoretical analysis. Such an analysis was performed by W. Bishara and K. Shtengel from Caltech, P. Bonderson and C. Nayak from Microsoft Research, and Joost Slingerland from our institute. They made a very strong case that non-abelian anyons have been seen.

Joost Slingerland became a fellow of our School of Theoretical Physics in September 2007. In 2008 he obtained a Science Foundation of Ireland Principal Investigator Grant. We hope that this means that SFI has decided to support research on quantum computing, a move which could secure a leading role of Ireland in European Information and Communication Technology. A start has been made by physicists from NUI Maynooth and DIAS who established a network of the European researchers who work on topological quantum computation. An application for funding has been made in Brussels. Independently of such funding, in September 2008 the Sixth Symposium on Topological Quantum Computation took place at DIAS. Slingerland accepted an offer from NUI Maynooth to become a Lecturer in Mathematical Physics in October 2008, but NUIM agreed to a late start in 2009, so that he has another year for research at DIAS. As Schrodinger fellow he was succeeded by Volker Braun, who came to DIAS in September 2008.

The discovery of non-abelian anyons is an important step on the way towards a quantum computer, but much more has to be done. The e/4 excitations can be used to perform something like a rotation by 90 degrees. For quantum computation one needs more flexibility, which can only be provided in somewhat more complicated two-dimensional systems. For one purpose the 90 degree option is sufficient, however, namely for the quantum protection of data transmission. Quantum cryptography was already used by the canton of Geneva in the Swiss national elections in October 2007. The ever increasing importance of data transmission and data handling is hardly affected by the present economic problems and has been of central importance for our School since the directorship of the late Professor John Lewis. A lasting consequence

Rinneadh Ánra de Joost Slingerland i Scoil na Fisice Teoiriciúla i mí Mheán Fómhair 2007. I 2008 fuair sé Deontas Príomhthaighdeora ó Fhondúireacht Eolaíochta Éireann. Tá súil againn go gciallaíonn sé seo go bhfuil sé beartaithe ag FEE tacú le taighde sa ríomh candamach, beart a d'fhéadfadh Éire a dhaingniú i ról ceannaireachta i dTeicneolaíocht Faisnéise agus Cumarsáide na hEorpa. Tá tús déanta ag fisiceoirí in Ollscoil na hÉireann, Maigh Nuad, agus i DIAS a bhunaigh gréasán de na taighdeoirí san Eoraip a oibríonn ar an ríomhaireacht chandamach thoipeolaíoch. Tá iarratas ar chistiú déanta sa Bhruiséil. Neamhspleách ar a leithéid de mhaoiniú, bhí an Séú Siompóisiam ar Ríomhaireacht Chandamach Thoipeolaíoch ar siúl i DIAS i mí Meán Fómhair 2008. Ghlac Slingerland le tairiscint ó Ollscoil na hÉireann, Maigh Nuad, le bheith ina Léachtóir san Fhisic Mhatamaiticiúil i mí Dheireadh Fómhair 2008, ach thoiligh NUIM le tosú déanach i 2009; dá bhrí sin tá bliain eile aige le taighde a dhéanamh ag DIAS. Lean Volker Braun, a tháinig go dtí DIAS i mí Mheán Fómhair 2008, é mar Ánra Schrodinger.

Tá fionnachtain na n-ainiain neamhaibéalacha ina céim thábhachtach i dtreo ríomhaire candamaigh ach tá mórán le déanamh fós. Is féidir na floscthaí e/4 a úsáid chun rothlú thart ar 90 céim a dhéanamh. Sa ríomhaireacht chandamach tá gá le solúbthacht breise nach féidir a sholáthar ach i gcórais déthoiseacha atá pas níos casta. Is leor an rogha 90 céim d'fheidhm amháin áfach, is í sin cosaint chandamach tharchurtha sonraí. Úsáideadh an chripteolaíocht chandamach cheana féin i dtoghcháin náisiúnta na hEilbhéise i mí Dheireadh Fómhair 2007 i gcantún na Ginéive. Is ar éigean a chuireann fadhbanna geilleagracha reatha isteach nó amach ar thábhacht tharchurtha sonraí, tábhacht atá ag dul i méid i gcónaí, agus a bhfuil tábhacht lárnach aige sa Scoil againne ó bhí an tOllamh John Lewis, nach maireann, ina stiúrthóir. Toradh buan air sin ná an tSraith Léachtaí John Lewis, atá comheagraithe ag an Hamilton Mathematics Institute i TCD agus an DIAS, a bhfuil tabhartais fiala faighte ó iar-scoláire de chuid an Ollaimh Lewis, Raymond Russell, agus a chomhlacht Corvil Networks. I mí Feabhra, thug Jennifer Tour Chayes, Ceannaire Ghrúpa na Teoirice ag Microsoft Research, léachtaí ar 'The Mathematics of Dynamic Random Networks' agus i mí Aibreáin, thug K. R. Sreenivasan, stiúrthóir Lárionaid Idirnáisiúnta na Fisice Teoiriciúla, Trieste, léacht ar shuaiteacht chrióigineach.

Achoimreofar an taighde eile sa Scoil i mbeagán focal. Lena mhac léinn Ciara Morgan, d'oibrigh an tOllamh Tony Dorlas ar fhaisnéis chandamach agus ar thoilleadh cainéal candamach. Le Erik Thomas ó Ollscoil Groningen, thug sé réiteach ar an tseanfhadhb faoi conas brí mhatamaiticiúil

is the John Lewis Lecture Series organised jointly by the Hamilton Mathematics Institute at TCD and by DIAS, which has obtained generous donations from Prof. Lewis' former student Raymond Russell and his company Corvil Networks. In February Jennifer Tour Chayes, Head of Theory Group at Microsoft Research gave lectures on 'The Mathematics of Dynamic Random Networks', and in April K. R. Sreenivasan, director of the International Centre of Theoretical Physics in Trieste gave a lecture on cryogenic turbulence.

Other research at our School will be summarized very briefly. Work on quantum information and the capacity of quantum channels was done by Prof. Tony Dorlas with his student Ciara Morgan. With Erik Thomas from the University of Groningen he gave a solution to the long-standing problem of giving a mathematical meaning to the path-integral formalism developed by the famous Richard Feynman of Caltech. With Schrodinger fellow A. M. Povolotsky from DIAS and V. B. Priezzhev from the Joint Institute for Nuclear Research in Dubna he related two important statistical processes, namely the totally asymmetric simple exclusion process and the vicious walker's model. In December he organized a conference on the mathematical aspects of transport in mesoscopic systems at DIAS, together with P. Duclos (Marseille). It was supported by a subvention from the French Embassy in Dublin and Le Centre de Physique Theorique de Marseille. With STP scholar M. Leitner, Prof. Werner Nahm worked on the properties of edges of graphene-type materials from the perspective of quantum field theory. Graphene is a two-dimensional carbon material with many potential applications and may yield an alternative to the gallium arsenide in topological quantum computation. Its edge stages are of great theoretical interest and may become practically important, in particular if magnetically active defects can be introduced in a controlled way. In December he organized a workshop on integrable quantum systems at DIAS. Prof. Denjoe O'Connor's work is focused on non-commutative geometry. With his PhD student R. Delgadillo-Blando and the former STP scholar B. Ydri he found a model which exhibits the emergence of geometry out of a purely algebraic, non-geometrical system. The main relevance of this kind of research is in the area of big bang physics at the beginning of time, but again the methods have a much broader significance.

With Charles Nash from NUI Maynooth, Denjoe analysed the zero temperature behaviour of the Kitaev model, which has been of crucial importance in the discussion of topological quantum computation and earned Kitaev a MacArthur award. Nash and O'Connor also found further models with similar topological properties. A mini-workshop on Fuzzy Physics and Random Matrices was held

a thabhairt d'fhoirmiúlachas an chosáin shuimeálaigh a d'fhorbair Richard Feynman clúiteach ó Caltech. Le A. M. Povolotsky, Ánra Shrodinger ón DIAS, agus le V. B. Priezzhev ón Institiúid Comhpháirteach Taighde Núicléigh i nDubna, cheangail sé dhá phróiseas thábhachtacha, an próiseas eisiaimh neamhshiméadrach simplí agus samhail an tsiúlóra fíochmhair. Le P. Duclos (Marseille), d'eagraigh sé comhdháil san DIAS i mí na Nollag ar ghnéithe matamaitciúla iompair i gcórais méiseascópacha. Thacaigh Ambasáid na Fraince i mBaile Átha Cliath agus Le Centre de Physique Theorique de Marseille leis le fóirdheontas. Le M. Leitner, Scoláire de chuid na Scoile, d'oibrigh an tOllamh Werner Nahm ar airíonna imeall ábhar graiféiteacha ó pheirspictíocht na réimsetheoirice candamaí. Ábhar déthoiseach carbóin is ea graiféin a bhfuil iliomad féidearthachtaí feidhmiúla aici agus a sholáthróidh, b'fhéidir, leagan eile in áit arsainíde gailliam sa ríomhaireacht chandamach thoipeolaíoch. Tá a cuid staideanna imeall an-suimiúil ó thaobh na teiorice de agus d'fhéadfadh tábhacht phraiticiúil a bheith leo, go háirithe más féidir lochtanna gníomhacha maighnéadacha a thabhairt isteach ar bhealach faoi rialú. I mí na Nollag, d'eagraigh sé ceardlann sa DIAS ar chórais candamacha insuimeálaithe. Díríonn obair an Ollaimh Denjoe O'Connor ar an gcéimseata neamh-inmhalartaithe. Le R. Delgadillo-Blando, a mhac léinn PhD, agus le B. Ydri, iar-scoláire na Scoile d'aimsigh sé samhail a léiríonn céimseata ag éirí as córas fíor-ailgéabrach neamhchéimseatúil. Baineann príomhábharthacht an chineáil seo taighde le réimse fisice na hollphléisce ag tús ama, ach arís, tá tábhacht i bhfad níos leithne leis na modhanna.

Le Charles Nash ó Ollscoil na hÉireann, Maigh Nuad, rinne Denjoe anailís ar iompraíocht shamhail Kitaev ag teocht nialasach, samhail ríthábhachtach sa phlé ar an ríomhaireacht chandamach thoipeolaíoch a thuill gradam MacArthur do Kitaev. D'aimsigh Nash agus O'Connor samhlacha breise le hairíonna toipeolaíochta de na cineálacha céanna. Bhí mioncheardlann ar an bhFhisic Dhoiléir agus ar Mhaitrísí Randamacha i mí Feabhra agus bhí O'Connor ina eagraí áitiúil don chéad chruinniú bliantúil den Líonra Céimseatan Neamh-inmhalartaithe sa DIAS i mí an Mheithimh.

Ina lán tíortha, bíonn claonadh sna hollscoileanna fáil réidh le hinstitiúidí sna daonnachtaí neamhbhrabúsacha. Glactar leis go teoiriciúil go bhfuil gnéithe eile sa saol seachas saothrú airgid, ach tá brúnna buiséid níos práinní ná an teoiric. Tá dearcadh eile againn sa DIAS, áit a bhfuil Scoil an Léinn Cheiltigh agus Scoil na Fisice Teoiriciúla lonnaithe le chéile ó bhunú na Institiúide. Go deimhin, is féidir le heolaíocht ár linne comhpháirtíochtaí an-torthúla a dhéanamh le léann na ndaonnachtaí. I mí na Bealtaine 2008, chruinnigh an dá Scoil

in February, and in June 2008 the first annual meeting of a EU financed Noncommutative Geometry Network took place at DIAS, with O'Connor as local organizer.

In many countries the universities tend to get rid of institutes in the unprofitable humanities. In theory it is agreed that there is more to life than money-making, but budgetary pressures are more urgent than theory. At DIAS the Schools of Celtic Studies and Theoretical Physics came together since the Institute was founded, so we have a different perspective. Indeed modern science can form very fertile partnerships with scholarship in the humanities. In May 2008 the two Schools held a common meeting to discuss the possibility of carrying out a 3D laser scanning project on the Ogam inscriptions, and to hear of the experiences of similar projects in England, Scotland, by the Peabody Museum and in Galway. All participants agreed that such a project was timely and urgent, due to the difficulties to protect the monuments against damage by man or nature. Funding for such a project will be applied for in the context of PRTLI 5.

As second to last item we should mention our modest and failed attempt to do something about the looming financial crisis. In the year 2008 institutions doing mathematics were still under pressure to invest in financial mathematics, meaning sophisticated mathematical ways to determine the price of derivatives etc. We knew that our former colleague Jim Simons had the strong opinion that none of this would survive the coming reality check. Simons has left mathematical physics to lead one of the world's most successful hedge funds and to become the 55th-richest person in America. We invited him to give the annual Statutory Public Lecture in 2008. Surely government would have listened, or maybe someone else. Unfortunately Simons told us that he was too busy. It turned out that he thought about ways to make money out of the ill-advised financial decisions of others. He earned an estimated $2.5 billion in 2008 and high respect.

In November 2008 the annual Statutory Public Lecture was given by Rolf-Dieter Heuer, since January 2009 the director general of CERN. He had to prepare to handle his own crisis, namely the accident which stopped the LHC just some days after it started to run in September 2008, and we are grateful that he could find the time to come to Dublin. Public interest was overwhelming and showed a strong and encouraging popular support for scientific research. We hope that the next annual reports will have more to say about progress in fundamental particle physics, and about money well spent in the interest of us all.

le chéile agus phléigh siad arbh fhéidir scanadh léasair 3D a dhéanamh ar inscríbhinní Oghaim agus d'éist siad le taithí dreamanna eile a rinne a leithéid de thionscadail i Sasana, in Albain, nGaillimh agus tionscadail a rinne Músaem Peabody. D'aontaigh na rannpháirtithe d'aonghuth go raibh a leithéid de thionscadal tráthúil agus práinneach de bharr gur deacair na séadchomharthaí a chosaint ar dhaoine agus ar an dúlra. Lorgeofar cistiú dá leithéid de thionscadal i gcomhthéas PRTLI 5.

Anois roimh an bhfocal scoir, ba chóir dúinn tagairt dár n-iarracht mírathúil measartha chun rud éigin a dhéanamh faoin ngéarchéim bhagrach airgeadais. Sa bhliain 2008 bhí brú fós ar institiúidí i mbun na matamaitice infheistiú sa mhatamaitic airgeadais, is é sin, modhanna sofaisticiúla chun praghas díorthach a fháil amach. Bhí fhios againn go raibh barúil láidir ag ár n-iarchomhleacaí Jim Simons nach mairfeadh aon cheann de na rudaí seo nuair a tháinig an chúis go cnámh na huillinne. D'fhág Simons an fhisic mhatamaiticiúil le bheith ina cheannaire ar cheann de na cistí fálaithe is rathúla ar domhan agus le bheith ar an 55ú duine is saibhre i Meiriceá. Thugamar cuireadh dó an léacht phoiblí reachtúil a thabhairt i 2008. Go deimhin, d'éistfeadh an rialtas leis, nó duine eile b'fhéidir. Ar an drochuair, dúirt Simons linn go raibh sé róghnóthach. Mar a tharla, d'oibrigh sé amach conas airgead a dhéanamh as cinntí éigríonna airgeadais daoine eile. Meastar gur thuill sé $2.5 billiún i 2008 agus thuill sé ardurraim freisin.

I mí na Samhna 2008 thug Rolf-Dieter Heuer, stiúrthóir ginearálta CERN ó mhí Eanáir 2009, an Léacht Phoiblí Reachtúil. Bhí air ullmhú lena ghéarchéim féin a réiteach, is é sin, an tubaiste a stop an LHC cúpla lá tar éis é a bheith curtha ar siúl i mí Meán Fómhair 2008 agus táimid buíoch go bhfuair sé an t-am le teacht go Baile Átha Cliath. Bhí an-suim go deo i measc an phobail, rud a léirigh tacaíocht spreagúil an phobail don taighde eolaíoch. Tá súil againn go mbeidh níos mó le rá i dtuairiscí bliantúla amach anseo faoi dhul chun cinn i bhfisic bhunúsach na gcáithníní agus faoi airgead caite go tairbheach ar mhaithe linn go léir.

Administration and Finance
Riarachán agus Airgeadas

Administration and Finance

In June 2008 the Registrar and the School Directors met with representatives of the Department of Education and Science. At the meeting the staffing levels and space requirements of the schools were discussed and a preliminary paper on the single site was presented.

HR

A number of academic, IT and administrative vacancies that arose during the year were filled. Additional researchers were also appointed on various externally-funded projects. An internal review of the academic staff in the School of Cosmic Physics was undertaken and a proposal on staff restructuring was submitted to the Department.

Training courses were offered to staff in the area of health and safety and retirement planning.

The other main focus was on updating pension regulations and improving systems for administering pensions.

Other

The transfer of books from an offsite storage facility Iron Mountain, to the new stores area at Fenian Street was completed in August 2008. This transfer also included some publications from the stores in Burlington Road. In addition, a new library security system was installed in the Celtic Studies library facility in Burlington Road.

Finance

In the area of finance, a new electronic purchase order system was installed which has greatly increased the turnaround of orders. A new online book sales system was implemented in December 2008 and is now widely used by our customers.

The online book-sales system can be accessed at the following address: https://books.dias.ie/

The attached financial statements report a surplus of €329,698 for the year.

This compares with a surplus of €163,796 in the year to 31st December 2007.

Riarachán agus Airgeadas

I mí an Mheithimh 2008 bhuail an Cláraitheoir agus Stiúrthóirí na Scoileanna le hionadaithe na Roinne Oideachais agus Eolaíochta. Ag an gcruinniú pléadh leibhéil foirne agus riachtanais spáis na scoileanna agus cuireadh i láthair réamhpháipéar faoin láithreán aonair.

Achmhainní Daonna

Bhí folúntais TF agus riarachán ann i rith na bliana agus líonadh iad. Ceapadh taighdeoirí breise ar thionscadail atá cistithe go seachtrach freisin. Rinneadh athbhreithniú inmheánach ar an bhfoireann acadúil i Scoil na Fisice Cosmaí agus cuireadh togra faoi athchóiriú foirne faoi bhráid na Roinne.

Tairgeadh cúrsaí don fhoireann sa réimse sláinte agus sábháilteachta agus i bpleanáil don lucht scoir.

Bhí an príomhfhócas eile ar rialacháin pinsean a thabhairt suas chun dáta agus ar chórais riartha pinsean a fheabhsú.

Eile

Críochnaíodh aistriú na leabhar ón tsaoráid stórála seachtrach in Iron Mountain go dtí an stóras nua i Sráid na bhFiníní i mí Lúnasa 2008. Aistríodh roinnt foilseachán leo as na stórais i mBóthar Bhurlington. Cuireadh córas slándála nua isteach i saoráid leabharlainne an Léinn Cheiltigh i mBóthar Bhurlington freisin.

Airgeadas

I réimse an airgeadais, cuireadh isteach córas nua le haghaidh orduithe ceannaithe agus dá bharr seo tá feabhas mór ar conas is féidir orduithe a chur amach. Cuireadh córas nua díolachán leabhar i bhfeidhm ar líne i mí na Nollag 2008 agus anois tá sé in úsáid go forleathan ag ár gcustaiméirí. Tá rochtain ar an gcóras díolachán leabhar ag an seoladh seo: https://books.dias.ie/

Tuairiscíonn na ráitis airgeadais ag gabháil leis seo barrachas €329,698 don bhliain.

Is féidir seo a chur i gcomparáid le barrachas €163,796 sa bhliain go dtí 31 Nollaig 2007.

Administration and Finance
Riarachán agus Airgeadas

Total income for the Institute decreased from €16,546,437 in 2007 after adjusting for pensions to €14,952,771 for 2008. This represents a decrease of €1,593,666 or 9.63% and the main decrease occurred in project income.

The Institute's total costs, after adjusting for the transfer to the capital reserves, also decreased from €16,382,641 in 2007 to €14,623,073 in 2008 i.e. a decrease of €1,759,568 or 10.74%.

The significant movements in costs took place in hosting costs for Bluegene and depreciation where the respective increases of €341,211, €799,568 arose. Also, there was a decrease of €1,734,529 in the amount transferred to capital reserves which represents the investment in the supercomputer at a cost of €2,322,279 in 2007 less a full year's depreciation of €776,000 in 2008.

Tar éis coigeartú le haghaidh pinsean, thit ioncaim iomlán na hInstitiúide ó €16,546,437 in 2007 go €14,952,771 in 2008. Seo laghdú €1,593,666 nó 9.63% agus bhí an príomhlaghdú i gcás ioncaim thionscadal.

Tar éis coigeartú d'aistriú chuig cúlchistí caipitil, thit costais iomlán na hInstitiúide freisin ó €16,382,641 in 2007 go €14,623,073 in 2008, .i. laghdú €1,759,568 nó 10.74%.

Tharla na hathruithe ba shuntasaí i gcás costais óstála Bluegene agus dímheasa mar ar tháinig méadú €341,211, €799,568 faoi seach. Bhí laghdú €1,734,529 freisin ar an tsuim a aistríodh chuig cúlchistí caipitil, a sheasann d'infheistíocht de €2,322,279 in 2007 ar an tsár-ríomhaire, lúide dímheas bliana iomlán de €776,000 in 2008.

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Appointed Members
A. Breslin
S. Ryan
H. Nicolai
M. Grünewald
M. Tuite
P. Knight
L. Hau
R. Dijkgraaf
S. Shatashvili

Governing Board of the School of Cosmic Physics

Chairman
G. Wrixon

Senior Professors
L. Drury
E. Meurs
A. Jones

Appointed Members
A. Khan
O. Glaser
C. Stehlé-Cojan
L. Enright
R. Perrott
L. Hanlon
M. Fowler

Administrative Staff of the Institute 2008

Registrar
C. Keaveney

Finance Officer
G. Forkin

Senior Administrative Officer
M. Burke

Assistant Finance Officer
R. Byrne

Clerks
T. Broderick
N. Granahan (to 15th August)
M. Loughman
H. Moynihan
E. Barrett
M. Brennan

Senior Administrator
M. Ó Gliasáin

Principal Administrator
M. Seoighe (on leave of absence)

HR Manager (part-time)
B. O'Donnell (contract from 28th October)

Staff
An Fhoireann

Support Staff
G. Casey
R. Jones
B. Judge
P. McDonald
M. Quinn†
C. Doyle
T. Ó Gríofa
K. Earley (from 3rd March)
P. Wynne (contract) (from 26th March)
B. Migas (contract) (from 3rd June)
A. Mac Conmara (temporary) (15th July to 25th July)

Staff and Scholars of the School of Celtic Studies 2008

Senior Professors
F. Kelly (Director)
L. Breatnach
P. Breatnach

Professors
M. McKenna
P. Ó Macháin

Assistant Professors
A. Nic Dhonnchadha
M. O Riordan
B. Ó Curnáin

Assistant Librarian
M. Kelly

Library Assistant
Ó. Ní Chanainn

School Administrator
E. Nic Dhonncha

Technical Staff ISOS
A. O'Brien

IT Support
A. McCarthy (part-time)
S. McCullagh (part-time)

Bibliographer
A. Guilarte (contract)

Bergin Fellows
R. McLaughlin
C. Downey

†Died 2 January 2008

Scholars
B. Miles (Canada) (to 31st August)
N. White (Ireland)
G. Ó Riain (Ireland)
F. Verstraten (Holland)
E. O'Flynn (Ireland) (from 1st October)

Irish Research Council for the Humanities and Social Sciences (IRCHSS) Government of Ireland Fellowship
G. Manning (Ireland)

Temporary Support Staff
J. O'Brien (to 6th June)

Professor Emeritus
M. Ó Murchú

Vacation Students
G. de Burca (from 3rd June to 8th August)
S. Rousseau (from 3rd June to 8th August)

Staff and Scholars of the School of Theoretical Physics 2008

Senior Professors
W. Nahm (Director)
T. Dorlas
D. O'Connor

Librarian
A. Goldsmith

School Administrator
M. Matthews

Systems Administrator
A. Jimenez (to 8th May)
J. Bucas (contract) (from 9th June)

Post-Doctoral Scholars
M. Leitner (Germany) (to 31st August)

Pre-Doctoral Scholars
C. Morgan (Ireland)
A. Ghesquiere (France)
P. Abramski (Russia)
S. Murray (Ireland) (to 29th February)

Schroedinger Fellows
A. Povolotsky (Russia)
J. Slingerland (Netherlands)
V. Braun (Germany) (from 1st September)

Project Staff
M. Samsonov (Russia) *"Mathematical Analysis of the Bethe Ansatz Solution of Spin Models".*

Embark Initiative Postdoctoral Research Fellows

S. Bal (India) (to 28th August) *"Dynamical Generation of space time and gauge group".*

O. Rosten (U.K.) (to 29th September) *"Manifestly Gauge Invariant QCD".*

F. Dolan (Ireland) (to 29th September) *"Aspects of N=4 Super Yang Mills".*

B. Qureshi (Pakistan) *"Noncommutative Spacetime Physics, Matrix Models and Hopf Algebras."*

V. Filev (Bulgaria) (from 15th September) *"Holographic study of the phase structure and universal properties of strongly coupled, flavoured, large N Yang-Mills gauge theory".*

V. Dotsenko (Russia) (from 1st October) *"Algebra and Representation Theory of Compatible Algebraic Structures".*

Staff and Scholars of the School of Cosmic Physics 2008

Senior Professors
L. Drury (Director)
A. Jones
E. Meurs

Professors
T. Ray
F. Aharonian

Assistant Professors
S. Lebedev (from 23rd January)
B. O'Reilly
P. Readman

Fellows
C. del Burgo (Spain)
X. Garcia (Spain) (to 27th June)
A. Lim (England)
M Chernyakova (Russia)

Experimental Officers
T. Blake
S. Dudzinski

Senior Technical Assistants
C. Horan
M. Smyth
G. Wallace

Technical Assistants
E. Flood
A. Grace
H. O'Donnell
L. Collins
C. Hogg (contract)

IT Technician
S. O'Sullivan (contract)

Clerical Staff
P. Daly
J. Lee (contract) (to 6th February)
A. Sewielska (contract) (from 26th April)

Scholars
M. Moorkamp (Germany) (to 29th February)
M. Miensopust (Germany)
S. Vergani (Italy) (to 16th November)
J. Mackey (Ireland)
E. Nichelli (Italy) (to 3rd April)
J. Schmoldt (Germany)
S. Delaney (Ireland)
D. Malyshev (Ukraine)
C. Melody (Ireland) (from 1st March to 30th June)
J. Sheehan (Ireland) (from 1st April to 30th September)
P. Share (South Africa) (from 1st August)
D. Khoza (South Africa) (from 1st August)
L. Fallon (Ireland) (from 1st September)
G. Polat (Turkey) (from 26th September)
L. Barreyre (France) (from 30th September)
J. Buckenmeyer (France) (from 1st October)
E. Mandolesi (Italy) (from 15th October)
M. Agius (Malta) (from 27th October)
N. Nooraee (Iran) (from 17th November)

Project Staff
R. Curran SFI project (to 14th January)
M. Muller SFI project
E. Whelan JETSET
F. de Colle JETSET (to 18th December)
J. Gracia JETSET
P. Dempsey IRCSET
L. Podio IRCSET
S. Gabici COSMIC RAY ORIGIN
E. Roux SFI project (from 1st March)
M. Kennedy IGGP (from 1st May)
K. Rochford e-INIS (from 16th June)
P. Rammos JETSET (from 1st September)
D. Coffey IRCSET (from1st November)

Vacation Students
G. Campbell DCU Intra-programme (from 31st March to 19th September)
S. Connaughton (from 23rd June to 29th August)
S. Hall (from 23rd June to 29th August)
J. Ilola (from 15th July to 8th September)
O. Brady (from 14th July to 20th August)

Temporary Support Staff
I. Pelcer (to 29th February)

Financial Statements
For year ended 31 December 2008

Contents

Statement of Responsibilities of the Council

The Council of the Dublin Institute for Advanced Studies is required under section 28(2) of the Institute for Advanced Studies Act 1940 to prepare financial statements in such form as shall be approved by the Minister for Education & Science with the concurrence of the Minister for Finance. In preparing those financial statements the Council is required to:

- select suitable accounting policies and apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Institute will continue in operation; and
- disclose and explain any material departures from applicable accounting standards.

The Council is responsible for keeping proper books of account which disclose with reasonable accuracy at any time the financial position of the Institute and which enable it to ensure that the financial statements comply with Section 28(2) of the Act. The Council is responsible for safeguarding the assets of the Institute and for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Statement on Internal Financial Control

Responsibility for Internal Financial Control

On behalf of the Council of the Institute I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or would be detected in a timely period.

Key Control Procedures

The Council has taken steps to ensure an appropriate control environment by

- clearly defining management responsibilities;
- establishing formal procedures for reporting significant control failures and ensuring appropriate corrective action.

The Council has established processes to identify and evaluate business risks by

- identifying the nature, extent and financial implication of risks facing the Institute including the extent and categories which it regards as acceptable;
- assessing the likelihood of identified risks occurring;
- assessing the Institute's ability to manage and mitigate the risks that do occur;
- assessing the costs of operating particular controls relative to the benefit obtained.

The system of internal financial control is based on a framework of regular management information, administrative procedures including segregation of duties, and a system of delegation and accountability. In particular it includes:

- comprehensive budgeting system with an annual budget which is reviewed and agreed by the Council of the Institute;
- regular reviews by the Council of periodic and annual financial reports which indicate financial performance against forecasts;
- setting targets to measure financial and other performance;
- adherence to public procurement guidelines;
- regular reviews by the Council of external research projects.

The Audit Committee continues to review internal control matters and issues raised by the Comptroller and Auditor General and Internal Auditor. In 2008, the Audit Committee met on one occasion.

In addition, the 2008 report on internal control systems as provided by the Internal Auditor has been made available to Members of Council.

The Council's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the Registrar and other officers within the Institute who have responsibility for the development and maintenance of an appropriate financial control framework and comments made by the Audit Committee and the Comptroller and Auditor General in his management letter or other reports.

Annual Review of Controls

I confirm that in the year ended 31st December 2008 Council conducted a review of the effectiveness of the system of internal financial controls of the Institute.

Signed on behalf of the Council of the Institute

Dervilla Donnelly
Chairman – Council of the Institute

29th June 2009

Report of the Comptroller and Auditor General

Report of the Comptroller and Auditor General for presentation to the Houses of the Oireachtas

I have audited the financial statements of Dublin Institute for Advanced Studies for the year ended 31 December 2008 under the Institute for Advanced Studies Act, 1940.

The financial statements, which have been prepared under the accounting policies set out therein, comprise the Accounting Policies, the Income and Expenditure Account, the Statement of Total Recognised Gains and Losses, the Balance Sheet, the Cash Flow Statement and the related notes.

Respective Responsibilities of the Council and the Comptroller and Auditor General

The Council is responsible for preparing the financial statements in accordance with the Institute for Advanced Studies Act, 1940, and for ensuring the regularity of transactions. The Council prepares the financial statements in accordance with Generally Accepted Accounting Practice in Ireland. The accounting responsibilities of the Members of the Council are set out in the Statement of Responsibilities of the Council.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

I report my opinion as to whether the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland. I also report whether in my opinion proper books of account have been kept. In addition, I state whether the financial statements are in agreement with the books of account.

I report any material instance where moneys have not been applied for the purposes intended or where the transactions do not conform to the authorities governing them.

I also report if I have not obtained all the information and explanations necessary for the purposes of my audit.

I review whether the Statement on Internal Financial Control reflects the Institute's compliance with the Code of Practice for the Governance of State Bodies and report any material instance where it does not do so, or if the statement is misleading or inconsistent with other information of which I am aware from my audit of the financial statements. I am not required to consider whether the Statement on Internal Financial Control covers all financial risks and controls, or to form an opinion on the effectiveness of the risk and control procedures.

I read other information contained in the Annual Report, and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements.

Basis of Audit Opinion

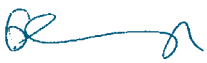
In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures and regularity of the financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgments made in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Institute's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In my opinion, the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland, of the state of the Institute's affairs at 31 December 2008 and of its income and expenditure for the year then ended.

In my opinion, proper books of account have been kept by the Institute. The financial statements are in agreement with the books of account.



Gerard Smyth
For and on behalf of the Comptroller & Auditor General

30 June 2008

Accounting Policies

GENERAL

The Institute was established under the Institute for Advanced Studies Act, 1940.

Its functions include the provision of facilities for the furtherance of advanced studies and the conduct of research in specialised branches of knowledge.

It comprises three Schools – Celtic Studies, Theoretical Physics and Cosmic Physics.

ACCOUNTING POLICIES

1. Basis of Accounting

The financial statements have been prepared on an accruals basis under the historical cost convention and in accordance with generally accepted accounting practice. Financial Reporting Standards recommended by the recognised accounting bodies are adopted as they become applicable.

2. Oireachtas Grants

Income is shown on a cash receivable basis.

3. Fixed Assets

Fixed Assets comprise the furniture, equipment, computers, supercomputer and motor vehicles of the Institute and are shown at cost less accumulated depreciation. The rates of depreciation, calculated on a straight line basis, are as follows:-

Furniture and Equipment	10%
Computers	25%
Motor Vehicles	25%
Supercomputer	33.3%

Premises occupied by the Institute are leased from the Office of Public Works.

4. Capital Reserve

The capital reserve represents the unamortised value of income used for the purchase of Fixed Assets.

5. Library

Expenditure on library books and materials is written off in the year in which it is incurred.

6. Publications

Expenditure on publications is written off in the year in which it is incurred.

7. Superannuation

The Dublin Institute for Advanced Studies operates a defined benefit pension scheme which is funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Education and Science and from contributions deducted from staff salaries.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are retained by the Dublin Institute for Advanced Studies. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Recognised Gains and Losses and a corresponding adjustment is recognised in the amount recoverable from the Department of Education and Science.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Education and Science.

8. Projects

The Dublin Institute for Advanced Studies receives external funding from industry, government bodies and the European Commission. A chart of accounts is maintained for each project.

Income and expenditure on projects is reflected in the financial statements in the year to which they relate. A surplus or deficit on a project is reflected in the financial statements when realised.

Income and Expenditure Account

	NOTES	2008 €	2007 €
INCOME			
Oireachtas Grant		8,044,000	7,882,000
Net deferred funding for pensions	10.c	1,521,928	1,638,031
Sales of Publications		58,288	63,010
Projects	2	4,662,941	6,829,359
Other	3	209,614	134,037
Contribution-Hosting of Bluegene		456,000	
		14,952,771	16,546,437
Transfer (to)/from Capital Reserve	5	821,436	(2,555,965)
		15,774,207	13,990,472
EXPENDITURE	1		
School of Celtic Studies		1,725,771	1,569,355
School of Theoretical Physics		1,342,934	1,206,836
School of Cosmic Physics		6,612,548	6,157,433
Administration		5,763,256	4,893,052
		15,444,509	13,826,676
Surplus for year		**329,698**	**163,796**
Balance at 1 January		712,664	548,868
Balance at 31 December		**1,042,362**	**712,664**

Statement of Recognised Gains and Losses		**2008**	**2007**
Surplus for the year		329,698	163,796
Experience (gains)/losses on pension scheme liabilities		(1,258,000)	85,000
Changes in assumptions underlying the present value of pension scheme liabilities		(226,000)	4,805,000
Actuarial Gain/Loss on Pension Liabilities	10.b	**(1,484,000)**	**4,890,000**
Adjustment to Deferred Pension Funding		1,484,000	(4,890,000)
Total Recognised Loss for the Year		**329,698**	**163,796**

The Statement of Accounting Policies and notes 1 to 12 form part of these financial statements.

Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Balance Sheet

	NOTES	2008 €	2007 €
ASSET			
Fixed Assets	4	2,678,655	3,500,091
Current Assets:			
Cash on Hand and at Bank		4,090,233	4,080,992
Debtors and Prepayments		693,166	351,263
Project Debtors	2	101,330	–
Total Assets		**7,563,384**	**7,932,346**
LESS LIABILITIES			
Creditors – Amounts falling due within one year			
Creditors and Accruals		994,592	496,199
Project Creditors	2	2,787,439	3,164,916
Creditors – Amounts falling due after one year	6	60,336	58,476
Total Liabilities Before Pensions		**3,842,367**	**3,719,591**
Assets Less Liabilities Before Pensions		**3,721,017**	**4,212,755**
Deferred Pension funding	10.c	32,718,000	29,712,000
Pension Liabilities	10.b	(32,718,000)	(29,712,000)
		0	0
NET ASSETS		**3,721,017**	**4,212,755**
Financed by:			
Income and Expenditure Account		1,042,362	712,664
Capital Reserve	5	2,678,655	3,500,091
		3,721,017	**4,212,755**

The Statement of Accounting Policies and notes 1 to 12 form part of these financial statements.

Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Cash Flow Statement

	NOTES	2008 €	2007 €
RECONCILIATION OF OPERATING SURPLUS TO NET CASH INFLOW FROM OPERATING ACTIVITIES			
Surplus for Year		329,698	163,796
Interest Received	3	(175,063)	(107,151)
Increase in Creditors		500,253	47,743
Increase in Debtors		(341,903)	(81,626)
Net Increase in Research Programmes and Fees		(478,807)	(63,306)
Depreciation	4	1,073,385	273,817
Capital Reserve Transfer	5	(821,436)	2,555,965
Loss on Disposal		(1,519)	1,720
Net Cash Inflow from Operating Activities		**84,607**	**2,790,958**
CASH FLOW STATEMENT			
Net Cash Inflow from Operating Activities		84,607	2,790,958
Returns on Investments and Servicing of Finance			
Bank Interest Received	3	175,063	107,151
Capital Expenditure			
Purchase of Tangible Assets	4	(250,430)	(2,831,502)
Increase in Cash		**9,241**	**66,607**
Reconciliation of Net Cash Flow to Movement in Net Funds			
Increase in Cash		9,241	66,607
Net Funds at 1 January		4,080,992	4,014,385
Net Funds at 31 December		**4,090,233**	**4,080,992**

Analysis of Change in Net Funds

	Cash at bank and in hand €	Total €
At Beginning of Year 2008	4,080,992	4,080,992
Cash Flows	9,241	9,241
At End of Year 2008	**4,090,233**	**4,090,233**

The Statement of Accounting Policies and notes 1 to 12 form part of these financial statements.

Dervilla Donnelly
Chairman – Council of the Institute

Werner Nahm
Council Member

Notes to the Financial Statements for the year ended 31/12/2008

1. Detailed Analysis of Income & Expenditure for the year ended 31/12/2008

	NOTES	School of Celtic Studies €	School of Theoretical Physics €	School of Cosmic Physics €	Admin-istration €	2008 €	2007 €
INCOME							
Oireachtas Grants		1,971,413	1,196,612	2,867,540	2,008,436	8,044,000	7,882,000
Net Deferred Funding for Pensions	10.c	(360,302)	(80,713)	(603,849)	2,566,792	1,521,928	1,638,031
Sales of Publications		58,288	–	–	–	58,288	63,010
Project Income	2	57,295	220,173	4,316,190	69,283	4,662,941	6,829,359
Other	3	5,845	3,700	23,694	176,375	209,614	134,037
Contribution-Hosting of Bluegene		–	–	–	456,000	456,000	–
		1,732,539	1,339,772	6,603,575	5,276,886	14,952,771	16,546,437
Transfer (to)/from Capital Reserve*		–	–	–	821,436	821,436	(2,555,965)
		1,732,539	**1,339,772**	**6,603,575**	**6,098,322**	**15,774,207**	**13,990,472**
EXPENDITURE							
Payroll Costs	7	1,557,329	1,008,233	2,130,419	793,400	5,489,380	5,194,446
Pension Costs	10.a	(47,910)	(40,038)	(89,568)	2,608,469	2,430,953	2,571,162
Pension Project Costs	10.a	(1,826)	(5,445)	(5,625)	–	(12,896)	–
Project Costs	2	64,322	225,618	4,321,816	–	4,611,756	4,160,622
Hosting Costs Bluegene		–	–	–	341,211	341,211	–
Library and Book Storage		42,446	98,965	62,635	47,068	251,114	219,826
Depreciation	4	–	–	–	1,073,385	1,073,385	273,817
Rent, Rates and Insurance		–	–	–	173,425	173,425	157,471
General Expenses	8	12,602	9,075	40,480	180,863	243,020	348,306
Travel and Seminar Expenses		34,715	30,401	90,390	10,940	166,446	154,967
Premises Maintenance and Security		–	–	–	230,591	230,591	288,626
Computer and Internet Expenses		4,900	5,258	35,260	60,705	106,123	121,640
Fuel Light and Power		–	–	–	146,347	146,347	113,569
Postage and Telephone		–	–	–	48,439	48,439	62,125
Stationery		10,424	6,032	4,973	33,010	54,439	60,517
Publications		44,591	–	2,954	–	47,545	47,302
Advertising		675	649	5,750	8,018	15,092	14,274
Minor Office Equipment		3,503	4,187	13,064	8,904	29,658	36,286
Loss on Disposal		–	–	–	(1,519)	(1,519)	1,720
		1,725,771	1,342,934	6,612,548	5,763,256	15,444,509	13,826,676
SURPLUS/(DEFICIT) FOR YEAR		6,768	(3,162)	(8,973)	335,065	329,698	163,796
Balance at 1 January		270,118	104,828	(264,408)	602,126	712,664	548,868
Balance at 31 December		**276,886**	**101,666**	**(273,382)**	**937,191**	**1,042,362**	**712,664**

*Note: In 2007 the DIAS invested in a supercomputer at a cost of €2,322,279 to be used by the research staff within the Institute and other research staff working in Ireland.

Continued

2. Projects

	2008 €	2007 €
Opening Balances	3,164,916	3,228,222
Receipts	4,184,134	6,766,053
	7,349,050	9,994,275
Closing Balances (Project Debtors €101,330 Project Creditors €2,787,439)	(2,686,109)	(3,164,916)
Applied as Income	**4,662,941**	**6,829,359**
Income Allocation		
School of Celtic Studies	57,295	12,136
School of Theoretical Physics	220,173	200,790
School of Cosmic Physics	4,316,190	3,955,403
	4,593,658	4,168,329
***Administration**	69,283	2,661,030
Total Project Income	**4,662,941**	**6,829,359**

Project Costs	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	2008 €	2007 €
Payments to Partners/Associates	–	–	3,186,196	3,186,196	2,821,703
Salaries/Scholarships	37,275	193,410	746,806	977,491	827,758
Travel	–	21,321	180,791	202,112	203,902
Other	27,047	10,887	208,023	245,957	307,259
Total Project Cost	**64,322**	**225,618**	**4,321,816**	**4,611,756**	**4,160,622**

*Note: In 2007 the DIAS invested in a supercomputer at a cost of €2,322,279 to be used by the research staff within the Institute and other research staff working in Ireland.

3. Other Income

	2008 €	2007 €
Bank Interest	175,063	107,151
Fees and Grants	3,300	–
Other	31,251	26,886
Total	**209,614**	**134,037**

4. Fixed Assets

	Furniture & Equipment €	Motor Vehicles €	Computers €	Total €
COST				
Opening Balance 1/1/2008	2,364,174	53,200	3,818,964	6,236,338
Additions	95,555	–	154,875	250,430
Disposals *	(109,512)	–	(3,524)	(113,036)
	2,350,217	53,200	3,970,315	6,373,732

			2008 €	2007 €
DEPRECIATION				
Opening Balance 1/1/2008	1,613,246	25,877	1,097,124	2,736,247
Charge 2008	116,487	13,327	943,571	1,073,385
Disposals *	(112,518)	–	(2,037)	(114,555)
	1,617,215	39,204	2,038,658	3,695,077
Net book value 31/12/2008	733,002	13,996	1,931,657	2,678,655
Net book value 31/12/2007	750,928	27,323	2,721,840	3,500,091

Note* Depreciated assets removed from register in prior periods, not posted to books of account.

5. Capital Reserve

	2008 €	2007 €
Balance at 1 January	3,500,091	944,126
Transfer from/(to) Income and Expenditure Account		
Income allocated to acquire fixed assets	250,430	2,831,502
Amortisation in line with asset depreciation	(1,073,385)	(273,817)
Amount released on disposals	1,519	(1,720)
	(821,436)	2,555,965
Balance at 31 December	2,678,655	3,500,091

6. Creditors due after twelve months

	2008 €	2007 €
These comprise: Vernon Hull Bequest	57,891	56,053
Carmondy Fund	2,445	2,423
	60,336	58,476

The funds relating to the above are held on deposit. No amounts were utilised during the year.

7. Payroll Costs

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin-istration €	2008 €	2007 €
Salaries/Wages	1,416,743	816,758	1,945,632	793,400	4,972,533	4,770,845
Scholarships	100,373	68,325	122,627	–	291,325	284,783
Visitors	39,713	123,150	62,160	–	225,023	137,718
Honoraria	500	–	–	–	500	1,100
	1,557,329	1,008,233	2,130,419	793,400	5,489,381	5,194,446

8. General Expenses

	Celtic Studies €	Theoretical Physics €	Cosmic Physics €	Admin-istration €	2008 €	2007 €
Miscellaneous	4,230	3,444	23,562	92,585	123,821	127,111
Promotions/Lunches	7,113	5,201	14,932	3,361	30,607	27,244
Professional Fees	–	–	–	46,977	46,977	158,907
Training	1,259	430	1,986	4,723	8,398	8,143
Audit Fee	–	–	–	18,800	18,800	18,800
Bank Charges	–	–	–	4,349	4,349	250
Health & Safety	–	–	–	10,068	10,068	7,851
	12,602	9,075	40,480	180,863	243,020	348,306

9. Leasing

Operating Leases

The premises occupied by the Institute are leased from the Office of Public Works.
The premises include Observatory House Dunsink, 5 Merrion Square, 9-10 Burlington Road and 31 Fitzwilliam Place.
There is a term of 88 years left on the lease for Observatory House and the other leases are renewed on an annual basis.
The commitment on foot of such leases in respect of 2009 is €113,609.

	Annual Rent €
Office of Public Works Leases	
Observatory House Dunsink	330
5 Merrion Square	5,022
9 -10 Burlington Road	50,167
31 Fitzwilliam Place	58,090
	113,609

10. Pension Costs

a) Analysis of total pension costs charged to Expenditure

	2008 (€'000)	2007 (€'000)
Current service cost	1,005	1,262
Interest on Pension Scheme Liabilities	1,658	1,519
Employee Contributions	(245)	(210)
	2,418	2,571

b) Movement in Net Pension Liability during the financial year

	2008 (€'000)	2007 (€'000)
Net Pension Liability at 1 January	(29,712)	(32,964)
Current Service Cost	(1,005)	(1,262)
Interest Costs	(1,658)	(1,519)
Actuarial loss/(gain)	(1,484)	4,890
Pensions paid in the year	1,141	1,143
Net Pension Liability at 31 December	**(32,718)**	**(29,712)**

c) Deferred Funding for Pensions

DIAS recognises these amounts as an asset corresponding to the unfunded deferred liability for pensions on the basis of the set of assumptions described above and a number of past events. These events include the statutory basis for the establishment of the pension scheme, and the policy and practice in relation to funding public service pensions including contributions by employees and the annual estimates process. While there is no formal agreement regarding these specific amounts with the Department of Education and Science, the DIAS has no evidence that this funding policy will not continue to meet such sums amount in accordance with current practice.

The Net Deferred Funding for Pensions recognised in Income and Expenditure Account was as follows:

	2008 (€'000)	2007 (€'000)
Funding recoverable in respect of current year pension costs	2,663	2,781
State Grant applied to pay pensioners	(1,141)	(1,143)
	1,522	1,638

The deferred funding asset for pensions as at 31 December 2008 amounted to €32.7 million (2007: €30 million).

d) History of defined benefit obligations

	2008 (€'000)	2007 (€'000)	2006 (€'000)
Defined benefit obligations	32,718	29,712	32,964
Experience (gains)/losses on Scheme Liabilities amount	(1,258)	85	(3,627)
Percentage of Scheme Liabilities	(3.84%)	0.29%	(11.00%)

The cumulative actuarial (gain)/loss recognised in the Statement of Total Recognised Gains and Losses amounts to (€3,406,000).

e) General Description of the Scheme

The pension scheme is a defined benefit final salary pension arrangement with benefits and contributions defined by reference to current "model" public sector scheme regulations.

The scheme provides a pension (eightieths per year of service), a gratuity or lump sum (three eightieths per year of service) and spouse's and children's pensions. Normal Retirement Age is a member's 65th birthday, and pre 2004 members have an entitlement to retire without actuarial reduction from age 60. Pensions in payment (and deferment) normally increase in line with general public sector salary inflation.

The valuation used for FRS17 disclosures has been based on a full actuarial valuation by a qualified independent actuary taking account of the requirements of the FRS in order to assess the scheme liabilities at 31 December 2008.

The principal actuarial assumptions were as follows:

	At 31/12/08	At 31/12/07	At 31/12/06
Rate of increase in salaries	4.00%	4.00%	4.00%
Rate of increase in pensions in payment	4.00%	4.00%	4.00%
Discount Rate	5.70%	5.50%	4.60%
Inflation Rate	2.25%	2.25%	2.25%

The mortality basis adopted allows for improvements in life expectancy over time, so that the life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2008, 2028 and 2048.

Year of attending Age	2008	2028	2048
Life expectancy – male	85.7	86.8	86.8
Life expectancy – female	88.8	89.8	89.8

f) Revised FRS17 Disclosures

The information on pensions has been presented in line with new disclosure requirements required from 2008 under an amendment to FRS 17.

Continued

11. Disclosure of Transactions

The Council of the Institute adopts procedures in accordance with guidelines issued by the Department of Finance in relation to the disclosure of interests by Council Members and these procedures have been adhered to by the Council Members during the year. No Council Member has declared an interest.

12 Approval of Accounts

The Financial Statements were approved by Council on the 15th June 2009.

Ráitis Airgeadais
don bhliain dár críoch 31 Nollaig 2008

Ábhar

Ráiteas Freagrachtaí na Comhairle

Éilítear ar Chomhairle Institiúid Ard-Léinn Bhaile Átha Cliath faoi alt 28(2) den Acht um Institiúid Ard-Leighinn, 1940 ráitis airgeadais a ullmhú ar shlí a cheadóidh an tAire Oideachais & Eolaíochta le comhthoiliú an Aire Airgeadais. Agus an Chomhairle ag ullmhú na ráitis airgeadais sin éilítear uirthi:

- polasaithe chuntasaíochta oiriúnacha a roghnú agus iad a chur i bhfeidhm go comhleanúnach;
- breithiúnais agus meastacháin a dhéanamh atá réasúnach agus stuama;
- na ráitis airgeadais a ullmhú ar bhonn gnóthais leantach mura bhfuil sé míchuí glacadh leis go leanfaidh an Institiúid ag oibriú; agus
- aon imeacht ábhartha ó chaighdeáin chuntasaíochta infheidhme a nochtadh agus a mhíniú.

Tá freagracht ar an gComhairle leabhair chuntais chearta a choinneáil a nochtaíonn ag aon am le cruinneas réasúnach staid airgeadais na hInstitiúide agus a chuireann ar a cumas a chinntiú go gcloíonn na ráitis airgeadais le hAlt 28(2) den Acht. Tá freagracht ar an gComhairle sócmhainní na hInstitiúide a shlánú agus as céimeanna réasúnacha a ghlacadh le cosc a chur ar chalaois agus ar neamhrialtachtaí eile agus iad a aimsiú.

Dervilla Donnelly
Cathaoirleach – Comhairle na hInstitiúide

Werner Nahm
Comhalta den Chomhairle

Ráiteas faoin gCóras Rialaithe Airgeadais Inmheánaigh

Freagracht as an gCóras Rialaithe Airgeadais Inmheánaigh

Thar ceann Chomhairle na hInstitiúide is mian liom ár bhfreagracht a chur in iúl lena chinntiú go ndéantar cothabháil agus go n-oibrítear córas rialaithe airgeadais inmheánaigh.

Ní féidir leis an gcóras ach dearbhú réasúnach agus ní dearbhú críochnaitheach a chur ar fáil go ndéantar slánú ar shócmhainní, go mbíonn idirbheartaíochtaí údaraithe agus taifeadta i gceart, agus go gcuirtear cosc ar earráidí ábhartha nó ar neamhrialtachtaí nó go n-aimseofaí iad i dtréimhse chaoithiúil.

Nósanna Imeachta Rialaithe Lárnacha

Tá céimeanna glactha ag an gComhairle lena chinntiú go mbeidh timpeallacht rialaithe chuí i bhfeidhm trí

- sainmhíniú soiléir a thabhairt maidir le freagrachtaí bainistíochta;
- nósanna imeachta foirmiúla a bhunú le teipeanna rialaithe suntasacha a thuairisciú agus lena chinntiú go dtógtar gníomh cuí leis an gceist a cheartú.

Tá próisis bunaithe ag an gComhairle le rioscaí gnó a aithint agus iad a luacháil trí.

- nádúr, méid agus tionchar airgeadais na rioscaí a bhíonn os comhair na hInstitiúide a aithint lena n-áirítear méid agus catagóir a mheasann an Institiúid a bheith inghlactha;
- measúnú a dhéanamh ar an dóchúlacht atá ann go dtarlóidh na rioscaí aitheanta;
- measúnú a dhéanamh ar chumas na hInstitiúide na rioscaí a tharlaíonn a bhainistiú agus a mhaolú;
- measúnú a dhéanamh ar na costais a bhaineann le rialacháin áirithe a oibriú a bhaineann leis an sochar a bhaintear amach.

Tá an córas rialaithe airgeadais inmheánaigh bunaithe ar chreat oibre eolais bainistíochta rialta, nósanna imeachta riaracháin lena n-áirítear dualgais a roinnt, agus córas toscaireachta agus cuntasachta. Áirítear leis go háirithe:

- córas buiséid cuimsitheach le buiséad bliantúil a ndéanann Comhairle na hInstitiúide athbhreithniú air agus a bhíonn comhaontaithe aici;
- athbhreithnithe rialta ag an gComhairle ar thuairiscí airgeadais tréimhseacha agus bliantúla a léiríonn feidhmíocht airgeadais in aghaidh réamhaisnéisí;
- spriocanna a leagan síos le feidhmíocht airgeadais agus feidhmíocht eile a thomhas;
- cloí le treoirlínte chun soláthar don earnáil phoiblí.
- athbhreithnithe rialta ag an gComhairle ar thionscadail taighde seachtaracha.

Lean ann an Coiste Iniúchta ag déanamh athbhreithniú (Tá an Coiste Iniúchta ag leanúint ag déanamh athbhreithniú) ar shaincheisteanna rialaithe inmheánaigh agus saincheisteanna a d'ardaigh an tArd-Reachtaire Cuntas agus Ciste. I 2008, bhuail an Coiste Iniúchta le chéile uair amháin.

Ina theannta sin, cuireadh tuarascáil an Reachtaire inmheánaigh ar chórais rialaithe inmheánaigh don bhliain 2008 ar fáil do bhaill na Comhairle.

Tá monatóireacht agus athbhreithniú na Comhairle ar éifeachtúlacht an chórais rialaithe airgeadais inmheánaigh coinnithe ar an eolas trí obair an iniúchóra inmheánaigh, trí obair an Chláraitheora agus oifigigh eile laistigh den Institiúid atá freagrach as creat oibre rialaithe airgeadais cuí a fhorbairt agus a chothabháil, agus trí thuairimí a dhéanann an Coiste Iniúchta agus an tArd-Reachtaire Cuntas agus Ciste ina litir bhainistíochta no i dtuairiscí eile.

Athbhreithniú Bliantúil ar Rialacháin

Dearbhaím go ndearna an Bord athbhreithniú ar éifeachtachas chórais rialaithe airgeadais inmheánaigh na hInstitiúide sa bhliain dár críoch 31ú Nollaig 2008.

Sínithe thar ceann Chomhairle na hInstitiúide

Dervilla Donnelly
Cathaoirleach – Comhairle na hInstitiúide

29 Meitheamh 2009

Tuarascáil an Ard-Reachtaire Cuntas agus Ciste le cur i láthair

Tuarascáil an Ard-Reachtaire Cuntas agus Ciste le cur i láthair Thithe an Oireachtais

Tá ráitis airgeadais Institiúid Ard-Léinn Bhaile Átha Cliath don bhliain dar críoch 31 Nollaig 2008 iniúchta agam faoin Acht Um Institiúid Ard-Léinn, 1940.

Tá na ráitis airgeadais, a ullmhaíodh faoi na beartais chuntasaíochta arna leagan amach sna ráitis, comhdhéanta de na Beartais Chuntasaíochta, an Cuntas Ioncaim agus Caiteachais, an Ráiteas Gnóthachan agus Caillteanas Aitheanta Iomlán, an Clár Comhardaithe, an Ráiteas ar Shreabhadh Airgid, agus na nótaí gaolmhara.

Freagrachtaí na Comhairle agus an Ard-Reachtaire Cuntas agus Ciste faoi seach

Tá an Chomhairle freagrach as na ráitis airgeadais a ullmhú de réir an Achta Um Institiúid Ard-Léinn, 1940, agus as rialtacht na n-idirbheart a chinntiú. Ullmhaíonn an Chomhairle na ráitis airgeadais de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn. Tá freagrachtaí cuntasaíochta Chomhaltaí na Comhairle leagtha amach sa Ráiteas um Fhreagrachtaí na Comhairle.

Is é m'fhreagrachtsa ná na ráitis airgeadais a iniúchadh de réir cheanglas ábhartha dlí agus rialúcháin agus Caighdeán Idirnáisiúnta maidir le hIniúchóireacht (Ríocht Aontaithe agus Éire).

Tuairiscím mo thuairim maidir le cibé an dtugann na ráitis airgeadais léargas fíorcheart, de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn. Tuairiscím freisin cibé, dar liom, an raibh leabhair chuntais chuí coinnithe. Lena chois sin, deirim cibé an dtagann na ráitis airgeadais leis na leabhair chuntais.

Tuairiscím ar aon chás ábhartha nár feidhmíodh suimeanna airgid chun na gcríoch a bhí beartaithe nó sa chás nach leanann na hidirbhearta do na húdaráis a rialaíonn iad.

Tuairiscím freisin mura bhfuil an fhaisnéis agus na mínithe ar fad faighte agam agus atá riachtanach chun críocha m'iniúchta.

Scrúdaím an Ráiteas maidir le Rialú Inmheánach Airgeadais le féachaint an léirítear ann gur chomhlíon an Institiúid an Cód Cleachtais maidir le Rialachas Comhlachtaí Stáit agus tuairiscím ar aon chás ábhartha nach ndéanann sé amhlaidh, nó más rud é go bhfuil an ráiteas míthreorach nó nach dtagann sé le faisnéis eile atá ar eolas agam de bharr na ráitis airgeadais a bheith iniúchta agam. Ní cheanglaítear orm a bhreithniú cibé an gclúdaíonn an Ráiteas maidir le Rialú Inmheánach Airgeadais gach priacal agus rialú airgeadais, ná teacht ar thuairim maidir le héifeachtacht na nósanna imeachta maidir le priacail agus rialú.

Léim faisnéis eile atá sa Tuarascáil Bhliantúil, agus breithním cibé an dtagann sé leis na ráitis airgeadais iniúchta. Breithním na himpleachtaí do mo thuarascáil má thagaim ar an eolas faoi aon rud atá, de réir cosúlachta, ina mhíráiteas nó ina neamhréireacht ábhartha leis na ráitis airgeadais.

An Bunús atá le mo Thuairim ar na Ráitis

I mbun m'fheidhme mar Ard-Reachtaire Cuntas agus Ciste, rinne mé m'iniúchadh ar na ráitis airgeadais de réir Caighdeán Idirnáisiúnta maidir le hIniúchóireacht (Ríocht Aontaithe agus Éire) arna n-eisiúint ag an mBord um Chleachtais Iniúchóireachta agus trí thagairt a dhéanamh do na nithe ar leith is gá a chur san áireamh i ndáil le cúrsaí bainisteoireachta agus oibriúcháin a ghabhann le comhlachtaí Stáit. Déantar scrudú mar chuid den iniúchadh, ar bhonn tástála, ar fhianaise a bhaineann le suimeanna agus rialtacht na n-idirbheart airgeadais a chuirtear san áireamh sna ráitis airgeadais, agus leis na hidirbhearta a fhoilsítear iontu. Chomh maith leis sin, cuimsíonn an t-iniúchadh measúnacht ar na meastacháin agus ar na breitheanna suntasacha a rinneadh agus na ráitis airgeadais á n-ullmhú, agus measúnacht le féachaint an n-oireann na beartais chuntasaíochta don bhail atá ar chúrsaí na hInstitiúide, ar feidhmíodh na beartais sin ar bhealach leanúnach agus ar foilsíodh iad ar bhealach sásúil.

Phleanáil mé agus rinne mé m'iniúchadh sa chaoi is go bhfaighinn an fhaisnéis agus na mínithe ar fad a mheas mé a bheith riachtanach ionas go mbeadh leordhóthain fianaise agam a d'fhágfadh cinnteacht réasúnach ann go bhfuil na ráitis airgeadais saor ó mhíráiteas ábhartha, cibé acu calaois nó neamhrialtacht eile nó earráid is cúis leis sin. I dteacht ar mo thuairim, rinne mé meastóireacht ar a shásúla is a cuireadh faisnéis i láthair sna ráitis airgeadais san iomlán freisin.

Tuairim

Is é mo thuairim go dtugann na ráitis airgeadais léargas fíorcheart, de réir Cleachtais Chuntasaíochta a nGlactar Leis go Coitianta in Éirinn, ar riocht ghnóthaí na hInstitiúide ag 31 Nollaig 2008 agus ar a hioncam agus ar a caiteachas don bhliain dar críoch sin.

Is é mo thuairim go raibh leabhair chuntais chuí coinnithe ag an Institiúid. Tá na ráitis airgeadais ag teacht leis na leabhair chuntais.

Gerard Smyth
Le haghaidh agus thar ceann an Ard-Reachtaire Cuntas & Ciste

30 Meitheamh 2008

Polasaithe Chuntasaíochta

GINEARÁLTA

Bunaíodh an Institiúid faoin Acht um Institiúid Ard-Leighinn, 1940.

Áirítear ar a cuid feidhmeanna saoráidí a sholáthar le hard-léinn a chur chun cinn tuilleadh agus le taighde a dhéanamh i mbrainsí speisialtachta eolais.

Tá trí Scoil inti – Scoil an Léinn Cheiltigh, Scoil na Fisice Teoiriciúla agus Scoil na Fisice Cosmaí.

POLASAITHE CHUNTASAÍOCHTA

1. Bunús Cuntasaíochta

Tá na ráitis airgeadais ullmhaithe ar bhonn fabhraithe faoin gcoinbhinsiún costais stairiúil agus de réir chleachtas cuntasaíochta a nglactar leo tríd is tríd. Glactar le Caighdeáin Thuairiscithe Airgeadais a bhí molta ag na comhlachtaí cuntasaíochta aitheanta mar is infheidhme iad.

2. Deontais Oireachtais

Taispeántar ioncam ar bhunús airgid isteach.

3. Sócmhainní Seasta

Is éard is Sócmhainní Seasta ann ná troscán, trealamh, ríomhairí agus mótarfheithiclí na hInstitiúide agus taispeántar iad ag costas lúide dímheas carntha. Is mar seo a leanas atá na rátaí dímheasa, ríofa ar bhunús dronlíneach:-

Troscán agus Trealamh	10%
Ríomhairí	25%
Mótarfheithiclí	25%
Sár-ríomhaire	33.3%

Faightear áitribh atá i seilbh na hInstitiúide ar léas ó Oifig na nOibreacha Poiblí.

4. Cúlchiste Caipitil

Léiríonn cúltaca caipitiúil luach neamh-amúchta ioncaim a úsáidtear le Sócmhainní Seasta a cheannach.

5. Leabharlann

Díscríobhtar caiteachas ar leabhair leabharlainne agus ábhair sa bhliain a dtabhaítear é.

6. Foilseacháin

Díscríobhtar caiteachas ar fhoilseacháin sa bhliain a dtabhaítear é.

7. Aoisliúntas

Pinsin Feidhmíonn Institiúid Ard-Léinn Bhaile Átha Cliath scéim phinsin shochair shonraithe a mhaoinítear go bliantúil ar bhonn íoc mar a imíonn tú ó chistí atá ar fáil dó, lena n-áirítear cistí a chuireann an Roinn Oideachais agus Eolaíochta ar fáil agus ó ranníocaíochtaí a asbhaintear ó thuarastail foirne.

Léirionn costais phinsin na sochair phinsin a thuilleann fostaithe sa tréimhse agus léirítear iad glan ar ranníocaíochtaí pinsin foirne a bhíonn coinnithe ag Institiúid Ard-Léinn Bhaile Átha Cliath. Aithnítear suim a chomhfhreagraíonn don mhuirear pinsin mar ioncam sa mhéid go bhfuil sé inaisghabhála, go ndéantar é a fhritháireamh in aghaidh deontais a bhíonn faighte sa bhliain chun íocaíochtaí pinsin a ghlanadh.

Tá gnóthachain nó caillteanais achtúireacha ar dhliteanais na scéime léirithe sa Ráiteas ar Ghnóthachain agus Caillteanais Aitheanta agus aithnítear coigeartú comhfhreagrach sa mhéid is féidir a aisghabháil ón Roinn Oideachais agus Eolaíochta.

Léiríonn na dliteanais phinsin luach reatha na n-íocaíochtaí pinsin don todhchaí atá tuillte ag an bhfoireann go dtí seo. Léiríonn maoiniú pinsin iarchurtha an tsócmhainn chomhfhreagrach a bheidh aisghafa i dtréimhsí amach anseo ón Roinn Oideachais agus Eolaíochta.

8. Tionscadail

Faigheann Institiúid Ard-Léinn Bhaile Átha Cliath maoiniú seachtarach ó thionscal, ó chomhlachtaí rialtais, agus ó Choimisiún na hEorpa. Coinnítear cairt chuntais i gcás gach tionscadal.

Léirítear ioncam agus caiteachas ar thionscadail sna ráitis airgeadais sa bhliain lena mbaineann siad. Taispeántar barrachas nó easnamh tionscadail sna ráitis airgeadais nuair a léirítear sin.

Cuntas Ioncaim agus Caiteachais

	NÓTAÍ	2008 €	2007 €
IONCAM			
Deontas Oireachtais		8,044,000	7,882,000
Glan-mhaoiniú iarchurtha do phinsins	10.c	1,521,928	1,638,031
Díolacháin Foilseachán		58,288	63,010
Tionscadail	2	4,662,941	6,829,359
Eile	3	209,614	134,037
Ranníocaíocht-Óstáil Bluegene		456,000	
		14,952,771	16,546,437
Aistriú (chuig)/ó Cúlchiste Caipitil	5	821,436	(2,555,965)
		15,774,207	13,990,472
CAITEACHAs	1		
Scoil an Léinn Cheiltigh		1,725,771	1,569,355
Scoil na Fisice Teoiriciúla		1,342,934	1,206,836
Scoil na Fisice Cosmaí		6,612,548	6,157,433
Riarachán		5,763,256	4,893,052
		15,444,509	13,826,676
Barraíocht don bhliain		**329,698**	**163,796**
Iarmhéid amhail an 1 Eanáir		712,664	548,868
Iarmhéid amhail an 31 Nollaig		**1,042,362**	**712,664**

Ráiteas ar Ghnóthachain agus Caillteanais Aitheanta	**2008**	**2007**
Barrachas don bhliain	329,698	163,796
Caillteanais/(gnóthachain) iarbhíre ar dhliteanais na scéime pinsin	(1,258,000)	85,000
Athruithe i dtoimhdí is bonn do luach reatha dhliteanais na scéime pinsin	(226,000)	4,805,000
Caillteanas/(gnóthachan) achtúireach ar Dhliteanais Phinsin 10.b	**(1,484,000)**	**4,890,000**
Coigeartú ar Mhaoiniú an Phinsin Iarchurtha	1,484,000	(4,890,000)
Gnóthachan iomlán aitheanta don bhliain	**329,698**	**163,796**

Is cuid de na ráitis airgeadais sin é an Ráiteas Beartais Cuntasaíochta agus nótaí 1 go dtí 12.

Dervilla Donnelly
Cathaoirleach – Comhairle na hInstitiúide

Werner Nahm
Comhalta den Chomhairle

Clár Comhardaithe

	NÓTAÍ	2008 €	2007 €
SÓCMHAINNÍ			
Sócmhainní Seasta	4	2,678,655	3,500,091
Sócmhainní Reatha:			
Airgead sa Lámh agus ag an mBanc		4,090,233	4,080,992
Féichiúnaithe agus Réamhíocaíochtaí		693,166	351,263
Féichiúnaithe Tionscadal	2	101,330	–
Sócmhainní Iomlána		**7,563,384**	**7,932,346**
LÚIDE DLITEANAIS			
Creidiúnaithe – Méideanna atá dlite laistigh de bhliain amháin			
Creidiúnaithe agus Fabhruithe		994,592	496,199
Creidiúnaithe Tionsadáil	2	2,787,439	3,164,916
Creidiúnaithe – méideanna atá dlite tar éis bliana amháin	6	60,336	58,476
Dliteanais Iomlána Roimh Phinsin		**3,842,367**	**3,719,591**
Sócmhainní (Glana) lúide dliteanais Roimh Phinsin		**3,721,017**	**4,212,755**
Maoiniú an Phinsin Iarchurtha	10.c	32,718,000	29,712,000
Dliteanais Phinsin	10.b	(32,718,000)	(29,712,000)
		0	0
SÓCMHAINNÍ GLANA		**3,721,017**	**4,212,755**
Maoinithe ag:			
Cuntas Ioncaim agus Caiteachais		1,042,362	712,664
Cúlchiste Caipiti	5	2,678,655	3,500,091
		3,721,017	**4,212,755**

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasaíochta agus na nótaí ó 1 go dtí 12.

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Ráiteas Sreabhadh Airgid

	NÓTAÍ	2008 €	2007 €
RÉITEACH BARRACHAIS OIBRÍOCHTA CHUIG GLAN-INSREABHADH AIRGID Ó GHNÍOMHAÍOCHTAÍ OIBRÍOCHTA			
Barrachas don bhliain		329,698	163,796
Ús infhaighte	3	(175,063)	(107,151)
Ardú i gCreidiúnaithe		500,253	47,743
Ardú i bhFéichiúnaithe		(341,903)	(81,626)
Glan-ardú i gCláir Thaighde agus Táillí		(478,807)	(63,306)
Dímheas	4	1,073,385	273,817
Aistriú Cúlchiste Caipitil	5	(821,436)	2,555,965
Caillteanas ar dhiúscairt		(1,519)	1,720
Glaninsreabhadh Airgid tirim ó ghníomhaíochtaí oibríochta		**84,607**	**2,790,958**
RÁITEAS SREABHADH AIRGID			
Glaninsreabhadh airgid ó ghníomhaíochtaí oibríochta		84,607	2,790,958
Aischuir ar infheistíochtaí agus seirbhísiú airgeadais			
Ús Bainc Infhaighte	3	175,063	107,151
Caiteachas Caipitiúil			
Ceannach Sócmhainní Inláimhsithe	4	(250,430)	(2,831,502)
Ardú ar Airgead		**9,241**	**66,607**
Réiteach glaninsreabhadh airgead tirim chuig gluaiseacht i nglanchistí			
Ardú ar Airgead Tirim		9,241	66,607
Iarmhéid faoin 1 Eanáir		4,080,992	4,014,385
Iarmhéid faoin 31 Nollaig		**4,090,233**	**4,080,992**

Anailís ar athrú i nglanchistí

	Anailís ar athrú i nglanchistí €	**Ró tharraingt €**	**Iomlán €**
I dtús na bliana 2008	4,080,992	–	4,080,992
Sreabhadh Airgid	9,241	–	9,241
Ag deireadh na bliana 2008	**4,090,233**	**–**	**4,090,233**

Is cuid de na ráitis airgeadais seo é an Ráiteas Beartais Cuntasíochta agus nótaí 1 go dtí 12.

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Comhalta den Chomhairle

Nótaí do na Ráitis Airgeadais

1. Anailís Shonraithe d'Ioncam & Caiteachas don bhliain dár críoch 31/12/2008

	NÓTAÍ	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riarachán €	2008 €	2007 €
IONCAM							
Deontais Oireachtais		1,971,413	1,196,612	2,867,540	2,008,436	8,044,000	7,882,000
Glan-mhaoiniú iarchurtha do phinsin	10.c	(360,302)	(80,713)	(603,849)	2,566,792	1,521,928	1,638,031
Díolacháin Foilseachán		58,288	–	–	–	58,288	63,010
Ioncam Tionscadail	2	57,295	220,173	4,316,190	69,283	4,662,941	6,829,359
Ioncam Eile	3	5,845	3,700	23,694	176,375	209,614	134,037
Ranníocaíocht-Óstáil Bluegene		–	–	–	456,000	456,000	–
		1,732,539	1,339,772	6,603,575	5,276,886	14,952,771	16,546,437
Aistriú (chuig) ó Chúlchiste Caipitil*		–	–	–	821,436	821,436	(2,555,965)
		1,732,539	**1,339,772**	**6,603,575**	**6,098,322**	**15,774,207**	**13,990,472**
CAITEACHAS							
Costais Phárolla	7	1,557,329	1,008,233	2,130,419	793,400	5,489,380	5,194,446
Costais phinsin	10.a	(47,910)	(40,038)	(89,568)	2,608,469	2,430,953	2,571,162
Costais Tionscnaimh Pinsin	10.a	(1,826)	(5,445)	(5,625)	–	(12,896)	–
Costais Tionscnamh	2	64,322	225,618	4,321,816	–	4,611,756	4,160,622
Costais Óstála Bluegene		–	–	–	341,211	341,211	–
Stóráil Leabharlainne agus Leabhar		42,446	98,965	62,635	47,068	251,114	219,826
Dímheas	4	–	–	–	1,073,385	1,073,385	273,817
Cíos, Rátaí agus Árachas		–	–	–	173,425	173,425	157,471
Costais Ghinearálta	8	12,602	9,075	40,480	180,863	243,020	348,306
Costais Taistil agus Seimineáir		34,715	30,401	90,390	10,940	166,446	154,967
Cothabháil Áitribh agus Slándáil		–	–	–	230,591	230,591	288,626
Costais ríomhairí agus Idirlín		4,900	5,258	35,260	60,705	106,123	121,640
Solas agus Cumhacht		–	–	–	146,347	146,347	113,569
Post agus Teileafón		–	–	–	48,439	48,439	62,125
Páipéarachas		10,424	6,032	4,973	33,010	54,439	60,517
Foilseacháin		44,591	–	2,954	–	47,545	47,302
Fógraíocht		675	649	5,750	8,018	15,092	14,274
Mion Trealamh Oifige		3,503	4,187	13,064	8,904	29,658	36,286
(Gnóthachan)/Caillteanas ar dhiúscairt		–	–	–	(1,519)	(1,519)	1,720
		1,725,771	1,342,934	6,612,548	5,763,256	15,444,509	13,826,676
BARRAÍOCHT/(EASNAMH) DON BHLIAIN		6,768	(3,162)	(8,973)	335,065	329,698	163,796
Iarmhéid amhail an 1 Eanáir		270,118	104,828	(264,408)	602,126	712,664	548,868
Iarmhéid amhail an 31 Nollaig		**276,886**	**101,666**	**(273,382)**	**937,191**	**1,042,362**	**712,664**

*Nóta: I 2007 cheannaigh an Institiúid sár-ríomhaire ar chostas €2,322,279 a úsáidfidh foireann taighde na hInstitiúide agus foireann taighde na hInstiúide eile a oibríonn in Éirinn.

2. Tionscadail

	2008 €	2007 €
Iarmhéideanna Tosaigh	3,164,916	3,228,222
Admhálacha	4,184,134	6,766,053
	7,349,050	9,994,275
Iarmhéideanna Deiridh (Féichiúnaithe €101,330 Creidiúnaithe €2,787,439)	(2,686,109)	(3,164,916)
Curtha i bhfeidhm mar ioncam	**4,662,941**	**6,829,359**
Leithroinnt Ioncaim		
Scoil an Léinn Cheiltigh	57,295	12,136
Scoil na Fisice Teoiriciúla	220,173	200,790
Scoil na Fisice Cosmaí	4,316,190	3,955,403
	4,593,658	4,168,329
***Riarachán**	69,283	2,661,030
Ioncam Iomlán Thionscadal	**4,662,941**	**6,829,359**

Costais Tionscadal	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	2008 €	2007 €
Íocaíochtaí chuig Páirtithe/Comhlachais			3,186,196	3,186,196	2,821,703
Tuarastail/Scoláireachtaí	37,275	193,410	746,806	977,491	827,758
Taisteal	0	21,321	180,791	202,112	203,902
Eile	27,047	10,887	208,023	245,957	307,259
Costas Iomlán Tionscadal	**64,322**	**225,618**	**4,321,816**	**4,611,756**	**4,160,622**

Nóta: I 2007 cheannaigh an Institiúid sár-ríomhaire ar chostas €2,322,279 a úsáidfidh foireann taighde na hInstitiúide agus foireann taighde na hInstiúide eile a oibríonn in Éirinn.

3. Ioncam Eile

	2008 €	2007 €
Ús bainc	175,063	107,151
Táillí & Deontais	3,300	–
Eile	31,251	26,886
Iomlán	**209,614**	**134,037**

4. Sócmhainní Seasta

	Troscán & Trealamh €	Mótar-fheithicilí €	Ríomhairí €	Iomlán €
COSTAIS				
Iarmhéid Tosaigh 1/1/2008	2,364,174	53,200	3,818,964	6,236,338
Breiseanna	95,555	–	154,875	250,430
Riartha *	(109,512)	–	(3,524)	(113,036)
	2,350,217	53,200	3,970,315	6,373,732
DÍMHEAS				
Iarmhéid Tosaigh 1/1/2008	1,613,246	25,877	1,097,124	2,736,247
Muirear 2008	116,487	13,327	943,571	1,073,385
Riartha *	(112,518)	–	(2,037)	(114,555)
	1,617,215	39,204	2,038,658	3,695,077
Luach glan de réir na leabhar 31/12/2008	733,002	13,996	1,931,657	2,678,655
Luach glan de réir na leabhar 31/12/2007	750,928	27,323	2,721,840	3,500,091

*Notá Sócmhainní luachlaghdaithe bainte ón gclár, níor breacadh iad sna leabhair chuntais.

5. Cúlchiste Caipitil

	2008 €	2007 €
Iarmhéid amhail an 1 Eanáir	3,500,091	944,126
Aistriú ó/(chuig) Cuntas Ioncaim agus Caiteachaist		
Ioncam leithroinnte le sócmhainní seasta a fháil	250,430	2,831,502
Amúchadh ag teacht le dímheas sócmhainní	(1,073,385)	(273,817)
Méid scaoilte ar dhiúscairtí	1,519	(1,720)
	(821,436)	2,555,965
Iarmhéid amhail an 31 Nollaig	**2,678,655**	**3,500,091**

6. Creidiúnaithe dlite tar éis dhá mhí dhéag

	2008 €	2007 €
Comhdhéanta as: Vernam Hull Bequest	57,891	56,053
Carmody Fund	2,445	2,423
	60,336	58,476

Tá an t-airgead a bhaineann leo seo sealbhaithe mar éarlais. Níor baineadh úsáid as aon mhéideanna le linn na bliana.

7. Costais Pháirolla

	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riar €	2008 €	2007 €
Tuarastal/Pá	1,416,743	816,758	1,945,632	793,400	4,972,533	4,770,845
Scoláireachtaí	100,373	68,325	122,627	–	291,325	284,783
Cuairteoirí	39,713	123,150	62,160	–	225,023	137,718
Honoraria	500	–	–	–	500	1,100
	1,557,329	1,008,233	2,130,419	793,400	5,489,381	5,194,446

8. Costais Ghinearálta

	Léann Cheilteach €	Fisic Theoiriciúil €	Fisic Chosmach €	Riar €	2008 €	2007 €
Ilghnéitheach	4,230	3,444	23,562	92,585	123,821	127,111
Tionscnaimh cur chun cinn/Lóin	7,113	5,201	14,932	3,361	30,607	27,244
Táillí Gairmiúla	–	–	–	46,977	46,977	158,907
Oiliúint	1,259	430	1,986	4,723	8,398	8,143
Táille Iniúchta	–	–	–	18,800	18,800	18,800
Muirir Bhainc	–	–	–	4,349	4,349	250
Sláinte & Sábháilteacht	–	–	–	10,068	10,068	7,851
	12,602	9,075	40,480	180,863	243,020	348,306

9. Léasáil

Léasanna Oibríochta

Tá na háitribh atá i seilbh na hInstitiúide ar léas ó Oifig na nOibreacha Poiblí.
Is iad na háitribh a n-airítear ná Réadlann Dhún Since, 5 Cearnóg Mhuirfean, 9-10 Bóthar Burlington agus 31Plás Mhic Liam.
Tá téarma 88 bliana fágtha ar an léas do Réadlann Dhún Since agus athnuaitear na léasanna eile ar bhonn bliantúil.
Is é tiomantas ar bhonn léasanna den sórt sin maidir le 2009 na €113,609.

	Cíos Bhliantúil €
Léasanna Oifig na nOibreacha Poiblí	
Réadlann Dhún Since	330
5, Cearnóg Mhuirfean	5,022
9-10 Bóthar Burlington	50,167
31, Plás Mhic Liam	58,090
	113,609

10. Costais Pinsean

a) Anailís ar na costais iomlána pinsin curtha chun dochair do Chaiteachas

	2008 (€'000)	2007 (€'000)
Costas seirbhíse reatha	1,005	1,262
Ús ar Dhliteanais na Scéime Pinsin	1,658	1,519
Ranníocaíochtaí Fostaí	(245)	(210)
	2,418	2,571

b) Gluaiseacht i nGlan-Dliteanas Pinsin i rith na bliana airgeadais

	2008 (€'000)	2007 (€'000)
Glan-Dliteanas Pinsin amhail an 1 Eanáir	(29,712)	(32,964)
An Costas Seirbhíse Reatha	(1,005)	(1,262)
Costais Úis	(1,658)	(1,519)
Caillteanas/(gnóthachan) achtúireach	(1,484)	4,890
Pinsin íoctha sa bhliain	1,141	1,143
Glan-Dliteanas Pinsin amhail an 31 Nollaig	**(32,718)**	**(29,712)**

c) Cistiú Iarchurtha do Phinsin

Aithníonn DIAS na méideanna seo mar shócmhainn a chomhfhreagraíonn don dliteanas iarchurtha neamh-mhaoinithe do phinsin bunaithe ar na toimhdí thuaslaithe agus ar roinnt imeachtaí a tharla cheana. Áirítear ar na himeachtaí seo an bonn reachtúil chun scéim aoisliúntais a bhunú, agus an polasaí agus an cleachtas i ndáil le pinsin seirbhíse poiblí a mhaoiniú, lena n-áirítear ranníocaíochtaí ag fostóirí agus próiseas na meastachán bliantúil. Cé nach bhfuil aon socrú foirmiúil maidir leis na méideanna sonracha seo déanta leis an Roinn Oideachais agus Eolaíochta, níl aon fhianaise ag DIAS nach leanfaidh an polasaí maoinithe seo de bheith ag freastal ar a leithéid de shuimeanna de réir an chleachtais reatha.

Sa Chuntas Ioncam agus Caitheachais, aithníodh an Glan-Mhaoiniú Iarchurtha do Phinsin sa bhliain mar seo leanas:

	2008 (€'000)	2007 (€'000)
Maoiniú inaisghabhála i ndáil le costais phinsin na bliana reatha	2,663	2,781
Deontas Stáit feidhmithe chun pinsinéirí a íoc	(1,141)	(1,143)
	1,522	1,638

Ba í €32.7 milliún an tsócmhainn mhaoinithe iarchurtha do phinsin amhail an 31 Nollaig 2008 (2007: €30 million).

d) Stair na nOibleagáidí faoin scéim shochair shainithe

	2008 (€'000)	2007 (€'000)	2006 (€'000)
Oibleagáidí shochair shainithe	32,718	29,712	32,964
(Gnóthachain)/caillteanais iarbhíre ar dhliteanais na scéime	(1,258)	85	(3,627)
Céatadán de luach dhliteanais na scéime	(3.84%)	0.29%	(11.00%)

Tá (gnóthachan)/caillteanas achtúireach carnach (€3,406,000) aitheanta sa Ráiteas d'Iomlán na nGnóthachan) agus na gCaillteanas Aitheanta.

e) Cur síos ginearálta ar an Scéim

Is é atá sa scéim pinsean ná socrú aoisliúntais shochair shonraithe chríoch-thuarastail le sochair agus ranníocaíochtaí faoi threoir rialachán reatha scéime 'eiseamláire' na hearnála poiblí.
Soláthraíonn an scéim pinsean (ochtóidí in aghaidh na bliana seirbhíse), aisce nó cnapshuim (trí hochtóidí in aghaidh na bliana seirbhíse) agus pinsin do chéilí agus leanaí. De ghnáth, is é an 65ú breithlá an aois scoir agus tá baill a thosaigh roimh 2004 i dteideal éirí as ag aois 60 gan aon laghdú achtúireach. De ghnáth, méadaíonn na pinsin atá á n-íoc (agus pinsin iarchurtha) de réir bhoilsciú ginearálta na hearnála poiblí.
Bunaíodh an luacháil a úsáideadh i gcás nochtadh faisnéise faoi FRS17 ar luacháil iomlán achtúireach a rinne achtúire neamhspleách cáilithe a chuir ceanglais FRS san áireamh chun dliteanais na scéime amhail an 31 Nollaig 2008 a mheasúnú.
Is mar a leanas a bhí na príomh-thoimhdí achtúireacha a úsáideadh:

	Ar 31/12/08	Ar 31/12/07	Ar 31/12/06
Ráta na nArduithe Tuarastail	4.00%	4.00%	4.00%
Ráta na nArduithe Pinsin atá á n-íoc	4.00%	4.00%	4.00%
Ráta Lascaine	5.70%	5.50%	4.60%
Ráta Boilscithe	2.25%	2.25%	2.25%

Leis an mbonn mortlaíochta atá á leanadh, is féidir dul chun cinn in ionchas saoil le himeacht ama a chur san áireamh; mar sin, braithfidh ionchas saoil ag dul ar scor ar an mbliain a shroichfidh ball aois scoir (65 bliana). Léiríonn an tábla thíos ionchas saoil na mball a shroichfidh aois 65 in 2008, in 2028 agus in 2048.

Aois 65 sa bhliain	2008	2028	2048
Ionchas saoil – fir	85.7	86.8	86.8
Ionchas saoil – mná	88.8	89.8	89.8

f) Dliteanais FRS17 Leasaithe

Tá an t-eolas ar phinsin curtha i láthair de réir na riachtanais nua i leith nochtadh faisnéise atá riachtanach ó 2008 faoi leasú do FRS 17.

11. Nochtadh Idirbheartaíochtaí

Glacann Comhairle na hInstitiúide le nósanna imeachta de réir threoirlínte atá eisithe ag an Roinn Airgeadais maidir le leasanna a nochtaíonn Comhaltaí na Comhairle agus chloígh Comhaltaí na Comhairle leis na nósanna imeachta sin le linn na bliana. Níor léirigh aon Chomhalta de chuid na Comhairle leas.

12 Ceadú Cuntais

Cheadaigh an Chomhairle na Ráitis Airgeadais ar an 15 Meitheamh 2009.

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